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Public Response to Cost-Quality Tradeoffs in Clinical Decisions.

Abstract

PURPOSE: To explore public attitudes toward the incorporation of cost-effectiveness analysis into clinical decisions.

METHODS: The authors presented 781 jurors with a survey describing 1 of 6 clinical encounters in which a physician has to choose between cancer screening tests. They provided cost-effectiveness data for all tests, and in each scenario, the most effective test was more expensive. They instructed respondents to imagine that he or she was the physician in the scenario and asked them to choose which test to recommend and then explain their choice in an open-ended manner. The authors then qualitatively analyzed the responses by identifying themes and developed a coding scheme. Two authors separately coded the statements with high overall agreement ($\kappa = 0.76$). Categories were not mutually exclusive.

RESULTS: Overall, 410 respondents (55%) chose the most expensive option, and 332 respondents (45%) choose a less expensive option. Explanatory comments were given by 82% respondents. Respondents who chose the most expensive test focused on the increased benefit (without directly acknowledging the additional cost) (39%), a general belief that life is more important than money (22%), the significance of cancer risk for the patient in the scenario (20%), the belief that the benefit of the test was worth the additional cost (8%), and personal anecdotes/preferences (6%). Of the respondents who chose the less expensive test, 40% indicated that they did not believe that the patient in the scenario was at significant risk for cancer, 13% indicated that they thought the less expensive test was adequate or not meaningfully different from the more expensive test, 12% thought the cost of the test was not worth the additional benefit, 9% indicated that the test was too expensive (without mention of additional benefit), and 7% responded that resources were limited.

CONCLUSIONS: Public response to cost-quality tradeoffs is mixed. Although some respondents justified their decision based on the cost-effectiveness information provided, many focused instead on specific features of the scenario or on general beliefs about whether cost should be incorporated into clinical decisions.

Keywords

Adult, Cost-Benefit Analysis, Cross-Sectional Studies, Decision Making, Female, Health Care Rationing, Humans, Male, Mass Screening, Middle Aged, Neoplasms, Practice Patterns, Physicians', Public Opinion, Risk Assessment, Surveys and Questionnaires, United States, Value of Life

Disciplines

Health and Medical Administration | Health Communication | Medical Humanities | Statistics and Probability

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Public Response to Cost-Quality Tradeoffs in Clinical Decisions

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Abstract

Purpose—To explore public attitudes toward the incorporation of cost-effectiveness analysis into clinical decisions.

Methods—The authors presented 781 jurors with a survey describing 1 of 6 clinical encounters in which a physician has to choose between cancer screening tests. They provided cost-effectiveness data for all tests, and in each scenario, the most effective test was more expensive. They instructed respondents to imagine that he or she was the physician in the scenario and asked them to choose which test to recommend and then explain their choice in an open-ended manner. The authors then qualitatively analyzed the responses by identifying themes and developed a coding scheme. Two authors separately coded the statements with high overall agreement ($\kappa = 0.76$). Categories were not mutually exclusive.

Results—Overall, 410 respondents (55%) chose the most expensive option, and 332 respondents (45%) chose a less expensive option. Explanatory comments were given by 82% respondents. Respondents who chose the most expensive test focused on the increased benefit (without directly acknowledging the additional cost) (39%), a general belief that life is more important than money (22%), the significance of cancer risk for the patient in the scenario (20%), the belief that the benefit of the test was worth the additional cost (8%), and personal anecdotes/preferences (6%). Of the respondents who chose the less expensive test, 40% indicated that they did not believe that the patient in the scenario was at significant risk for cancer, 13% indicated that they thought the less expensive test was adequate or not meaningfully different from the more expensive test, 12%

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thought the cost of the test was not worth the additional benefit, 9% indicated that the test was too expensive (without mention of additional benefit), and 7% responded that resources were limited.

Conclusions—Public response to cost-quality tradeoffs is mixed. Although some respondents justified their decision based on the cost-effectiveness information provided, many focused instead on specific features of the scenario or on general beliefs about whether cost should be incorporated into clinical decisions.

Keywords

decision making; public opinion; cost-benefit analysis; health care rationing

There has been a significant amount of debate within the medical and bioethical literature regarding whether physicians should consider cost when making treatment decisions for individual patients.^{1–23} Physicians are often in the position to make cost-quality tradeoffs, and several surveys have confirmed that physicians are willing to do so in a variety of clinical settings.^{6,24} Proponents of physicians making cost-quality tradeoffs argue that physicians are in the best position to make such tradeoffs to control health care costs.¹ Opponents argue that such “bedside rationing” would undermine patient trust, violate clinicians’ advocacy duties, and be discriminatory.

Although the public is collectively the obvious stakeholder in this debate, no data suggest whether the public thinks physicians ought to make cost-quality tradeoffs when interacting with individual patients. Understanding public attitudes is important in part because opponents argue that such cost-quality tradeoffs will decrease patients’ trust in their physicians. Moreover, public opinion might inform physicians’ judgments about when it is appropriate to make cost quality tradeoffs.

We designed this study to observe public response to cost-quality tradeoffs in clinical decisions. Specifically, we asked people to imagine themselves as a physician faced with a cost-quality tradeoff in deciding how to screen a hypothetical patient for cancer. We sought to determine 1) the proportion of the general public that would recommend a less effective but less expensive cancer screening strategy, 2) the relationship between the cost-effectiveness of a cancer screening test and the public’s willingness to recommend its use, and 3) the public’s reasons for these choices.

METHODS

Study Design and Population

We conducted a cross-sectional survey of prospective jurors in Philadelphia County. Prospective jurors are chosen from driver license and voter registration databases and therefore come from a broad array of backgrounds.

Survey Content

Each subject received 1 of 6 clinical scenarios in which a physician must choose between several cancer screening tests for a hypothetical patient. In all scenarios, we described the patient as healthy with no family history of cancer (except for the gastric cancer scenario; see next page), and we explicitly stated that the patient’s insurance covered the cost of all cancer screening. We presented cost-effectiveness data for each screening test, and in every scenario, the most effective test was also more expensive. The scenarios used in this study were originally developed for an earlier study of physician response to cost-effectiveness information. In the current study, the respondent was asked to imagine being the physician

in the scenario, to choose which test to recommend (most expensive, less expensive, or no screening), and to explain that choice in an open-ended manner.

Scenarios—We developed 6 cancer screening scenarios described in detail in Appendix A and summarized in Table 1. Three of the scenarios were examples of familiar cancer screening decisions that physicians make: screening for colon cancer using annual fecal occult blood testing (FOBT) v. annual FOBT plus flexible sigmoidoscopy every 5 years v. annual FOBT plus colonoscopy every 5 years, screening for cervical cancer using Pap smears every 3 years v. every year, and screening for breast cancer with mammograms beginning at age 50 v. age 40.

We developed 3 additional scenarios in which either the cancer or one of the screening tests was either unspecified or unfamiliar. Each unfamiliar scenario presented the same cost-effectiveness ratios for the cancer screening tests as its corresponding familiar scenario. One of these scenarios was completely blinded with respect to detail: screening for “cancer X” using test A, test B, or test C. Another used routine Pap smears v. a hypothetical, more sensitive screening test (“PapFinder”) to screen for cervical cancer. A final scenario involved screening for gastric cancer in a woman with a family history of gastric cancer beginning at age 50 years v. age 40 years.

Presentation of cost-effectiveness data—Following description of the patient’s clinical characteristics, respondents were presented with information about the dollar cost and effectiveness (in years of life saved) for each of the different screening options. This cost-effectiveness information was presented both within the body of the text and in a separate table. An example of one of the tables is shown in Appendix B.

The cost-effectiveness ratios of the least effective test were always presented as the cost per year of life saved using that test compared with no screening. To determine whether the cost-effectiveness of the screening strategy influenced people’s recommendations, we varied the type of cost-effectiveness information that we provided to subjects. In half the surveys, the cost-effectiveness ratio of the more effective test was presented as the cost/year of life saved using the more effective test compared with no screening. This representation is traditionally computed by comparing the benefits and costs of using a screening test with the benefits and costs of not using the screening test. For our survey, we used the average of published cost-effectiveness ratios (calculated in this way) for a given screening test and therefore refer to this value as the *average* cost-effectiveness ratio. In the remaining half of the surveys, the cost-effectiveness ratio of the more effective test was presented as the cost/year of life saved using the more effective test compared with using the next best alternative that, in our examples, was the less effective test. In this article, we refer to this as the *incremental* cost-effectiveness.

Incremental cost-effectiveness ratios are often surprisingly high. For example, the average cost-effectiveness of annual Pap smears (i.e., the cost to save a year of life that would not be saved if no screening were performed) was \$39,601 per life year gained, whereas the incremental cost-effectiveness (i.e., the extra cost to save an extra year of life that would not be saved if Pap smears were performed every 3 years) was \$782,500 per life year gained. Although economists agree that incremental cost-effectiveness is the appropriate way to assess the relative merit of a more expensive screening option when a less expensive option is available, we did not expect the public to appreciate this distinction. Thus, we considered this manipulation to be effectively a manipulation of perceived cost. (We could have simply manipulated cost without bothering to manipulate the average/incremental distinction, but we chose not to do so for 2 reasons. First, we did not wish to present erroneous cost-effectiveness information about real screening tests. Second, we wished to keep our

materials identical to those used in a prior study of physicians.²⁴) If subjects focus on the dollar figure, as we suspected they would, then people receiving the average cost-effectiveness Pap smear questionnaire should be more likely to recommend annual Pap smears than those receiving the incremental cost-effectiveness version.

Cost-effectiveness information for the familiar scenarios was taken from published literature. Depending on the scenario and how the costs were framed, the cost of using the more effective test ranged from \$32,672 to \$782,500 to save 1 year of life (Table 1).

Subject Randomization

As described above, we developed 2 versions (average and incremental cost-effectiveness presentations) of each of the 6 clinical scenarios for a total of 12 survey versions. Each survey version presented only 1 of the 6 scenarios with only 1 of the 2 cost-effectiveness presentations. Subjects were randomized to receive 1 of 12 survey versions.

Survey Administration

Prospective jurors were approached by research assistants in the court waiting area and asked if they would be willing to participate in our study. Those who agreed to participate were offered a candy bar. Study participants were then given a written survey, and if they asked questions, the research assistants were trained to clarify only the information on the survey rather than elaborating or providing any additional information. Our survey instrument and the research protocol received approval from the institutional review board at the University of Pennsylvania Medical Center.

Analysis

Our main outcome variable was the decision to recommend the most effective cancer screening strategy v. choosing to recommend a less effective strategy (a less effective option or no screening at all). First, we used descriptive statistics to determine the percentage of respondents who chose to recommend the most effective test; we then used chi-square tests to determine relationships between respondent demographic characteristics and the decision to recommend the most effective test.

We conducted 2 different analyses to determine the relationship between the cost per year of life saved using the more effective test and the decision to recommend its use. First, within each of the scenarios, we used chi-square tests to determine whether respondents were more likely to choose the most effective screening strategy when presented with the average cost-effectiveness information (in which the cost estimate of the most effective test appears lower) v. the incremental cost-effectiveness information (in which the cost estimate of the most effective test appears higher). Then, we conducted a logistic regression with the decision to recommend the most effective test as the dependent variable and the cost/year of life saved using the most effective test as a linear independent variable while controlling for the way in which the costs were framed (average v. incremental).

Finally, we qualitatively analyzed the open-ended responses to understand why respondents chose to recommend the more or less effective screening strategy. Two senior authors and 2 research assistants worked together to identify themes and develop a coding scheme on half of the subjects, randomly selected. Then, 2 research assistants separately coded all responses with good overall agreement ($\kappa = 0.76$). Differences were then resolved with consensus discussion among the 2 research assistants and 2 senior authors.

RESULTS

Respondent Characteristics

There were 781 jurors who participated in our study. The mean age of participating jurors was 43 years, and 66% were female. The majority identified themselves as either African American (42%) or white (51%). The majority (61%) reported fewer than 16 years of education. There were no significant differences in respondents' age, gender, race, or education between survey versions.

Choice of Screening Recommendation

When assuming the role of physician, 55% of respondents chose the more effective cancer screening strategy overall. The remainder chose the less effective test (41.5%) or no screening at all (3.5%). The relationship between choosing the more effective test and respondent age, sex, education, and race is shown in Table 2. Women and respondents with less than 16 years of education were more likely to choose the more effective screening test. There were no significant differences in age or race among those choosing the more or less effective screening test.

Respondents' willingness to recommend the more effective test varied by scenario, as shown in Table 1, with as few as 28% choosing the more effective test in some scenarios.

Relationship between Cost and Willingness to Recommend the More Effective Test

The 2 right-hand columns of Table 1 present the percentage of respondents who chose the more effective test among those receiving the average v. the incremental cost-effectiveness data in each scenario. There were no significant differences by type of information presented within any of the scenarios. Figure 1 demonstrates the relationship between the cost of the more effective test and public willingness to recommend its use (the data presented in Figure 1 represent both the familiar and unfamiliar conditions). As the cost in dollars of the more effective test increased, there was no corresponding decrease in the percentage of respondents who recommended its use. As the cost of the test increased, the odds of recommending the most effective test did not change (odds ratio [OR] = 1.0, confidence interval [CI] = 1.00–1.00).

Explanations for Screening Recommendations

Overall, 82% of respondents included a written explanation of their chosen screening recommendation. Tables 3 and 4 summarize the most common factors that influenced subjects' decisions to choose a more or less effective test.

Explanations for choosing the most expensive strategy—The most common reason for choosing the more effective screening test focused on its enhanced effectiveness. Of the respondents, the 40% who chose the most expensive strategy did so because they believed the test was better. Benefits of the more effective test were most often conceptualized as “more years/life saved,” but there were a variety of other ways of describing benefit, for example, “to feel safe” or “to find out if there is a problem,” and “early detection leads to early cure.”

Several responses in this category seemed to indicate that the respondents' recommendations were based on a preconceived idea about that particular screening test rather than on the cost-effectiveness data provided. These responses were more common in the breast and cervical cancer scenario, in which 19 respondents indicated that “women should get mammograms every year,” “it is recommended that women have Pap smears every year,” or “there are still too many woman not having Pap smears every year.”

One-fifth (22%) of respondents indicated that life is priceless or that cost should be irrelevant. Another fifth (20%) were concerned about the risk of cancer in the particular patient in the scenario, usually focusing on her age and/or family history. These comments were particularly common for the gastric cancer scenario in which the patient was described as having a family history of cancer. In this scenario, almost half of the written comments of respondents who chose the most expensive strategy indicated specific concern about her family history.

Of the respondents, 6% gave an anecdote or a personal preference but no other justification for their choice, and 5% indicated that the patient was entitled to the more expensive test because the patient was covered by insurance. Another 5% of respondents thought that the more expensive test would actually be cost-effective. A small number (3%) specifically said that doctors should not consider the cost of medical treatment.

Explanations for choosing the less expensive strategy—The most common reason for choosing a less expensive screening test focused on the respondent's perception that the risk of cancer for the particular patient in the scenario was insignificant. Two-fifths (40%) of respondents who chose the least expensive screening strategy indicated in their written comments that they did not believe the patient needed the more expensive test. In general, these respondents did not believe she was at risk for cancer either because of her age, her lack of family history, the fact that she is healthy, or some combination of the above.

Of the respondents, 13% chose the less expensive screening strategy based on their belief that the less effective test was good enough or no different than the more effective test. Of these, a few actually thought that the less effective test was better ("a yearly test could save a lot of lives"). This misconception occurred only with the colon cancer scenario, in which the less effective test offered screening at more frequent intervals than the more effective test.

Only 12% of respondents specifically mentioned that the cost was not worth the benefit of the more effective test. Another 9% indicated concern about cost but did not specifically mention the tradeoff in benefits, and 7% acknowledged that resources are limited or that the money could be better used elsewhere. Finally, 4% of respondents who chose the less effective screening test indicated that they believed life is priceless (or that physicians should not consider cost at all) but that the patient in the scenario did not really need the test (or that the test was good enough).

DISCUSSION

Is there public support for physicians making cost-quality tradeoffs for individual patients? Our study suggests that public opinion is mixed. Even under hypothetical conditions without cost constraints, almost half recommended a less effective test and half recommended a more effective test. Had we made budget constraints more explicit in the scenarios, we expect that more people would agree to the tradeoff.

Our study found that there was no consistent threshold for the amount of money the public was willing to spend to save 1 year of life. As the cost per year of life saved by the most expensive test increased from \$32,000 to \$782,000, there was no corresponding decrease in the percentage of respondents who recommended its use. Qualitative analysis helped to explain these complex and intriguing findings. Most of the respondents' explanations focused either on general beliefs about whether cost should be incorporated into clinical decisions or on specific features of the patients (indicating high or low risk for cancer) or the screening tests (that respondents either liked or did not like) described in the scenario. It is

also likely that some respondents did not appreciate the relative differences between such high costs because even \$32,000 (the lowest cost-effectiveness ratio for the more effective/more expensive tests) is a lot of money for most people. In either case, most respondents did not justify their recommendation based on the specific cost-effectiveness data themselves, and so their decision was completely insensitive to the cost of the more effective test.

Three specific features of the scenarios that influenced respondents' choices deserve consideration: the preferences to screen patients with a family history of cancer, to screen at earlier ages or more frequent intervals, and to screen for familiar cancers with familiar screening tests. First, all but 1 of our hypothetical scenarios were constructed so that patients did not have a family history of cancer. Many subjects receiving these scenarios wrote that there is no reason to screen someone who has no family history of cancer, reflecting people's unfamiliarity with the importance of screening patients even when there is no family history. By contrast, the patient described in the gastric cancer scenario was said to have a family history of gastric cancer. We constructed this scenario in such a manner to make the scenario more plausible. Many members of the public, in reading the scenario, wrote that this hypothetical patient needed to receive early gastric cancer screening because of her family history. Indeed, respondents recommended aggressive cancer screening in the gastric scenario more often than in any of the other scenarios, even the scenarios in which aggressive screening was more cost-effective than in the gastric cancer case, such as the colon cancer and unspecified cancer scenarios.

Another feature of the scenarios that was important to respondents was screening at earlier ages or more frequent intervals. This was particularly relevant in both the gastric cancer and breast cancer scenarios in which respondents had to choose to begin screening at age 40 v. 50 years. Many of those who chose to begin screening earlier (the more expensive option) indicated in their written response that "early detection means early cure." This preference also became apparent in the colon cancer scenario in which the public had to choose between annual FOBT alone and colonoscopy every 5 years plus annual FOBT. Some of those who chose annual FOBT alone indicated in their response the belief that getting tested every year was somehow preferable to getting tested every 5 years. These respondents seemed not to understand that the more expensive option carried all the benefits of annual screening along with the additional benefits of colonoscopy testing every 5 years.

Finally, respondents displayed an attitude in their written comments indicating a preference for 2 of the familiar screening tests: annual Pap smears and mammography beginning at age 40. These 2 scenarios are particularly notable given the extreme difference in cost between the less and more expensive screening strategies. The percentage of respondents choosing annual Pap smears rather than Pap smears every 3 years did not significantly change depending on whether the difference in the dollar amount per year of life for the more effective v. less effective option was \$22,000 or \$755,000. Public preference for annual Pap smears is seemingly unaffected by cost.

When comparing public responses to physician responses in a similar survey,²⁴ among familiar scenarios, the public expressed stronger preference for the more expensive cervical and breast cancer screening options (annual Pap smears and mammograms beginning at age 40) than physicians did but similar (and lower) levels of preference for the most expensive colon cancer screening option (annual FOBT with colonoscopy). Neither the public's nor the physicians' preferences changed in response to changing the way in which the cost-effectiveness information was presented (average v. incremental) in the familiar scenarios. In the unfamiliar scenarios, however, physicians were much less likely to recommend the more expensive screening option in all of the scenarios than the public.

Our qualitative findings confirm what other studies have shown: that public responses to hypothetical rationing situations are often generated by factors that are not anticipated by investigators²⁵ and not envisioned by economists.²⁶ Previous studies have shown that public views can change after discussion and deliberation on such issues.²⁷ Indeed, it is unclear from our data how people would respond after all misconceptions were resolved and debate were encouraged. However, our study does provide significant insight into the public's initial thought process on this issue.

Our study has several limitations. First, not all respondents appeared to have considered the choice to be a tradeoff. Although we presented cost-effectiveness information indicating the presence of a tradeoff situation, this information was presented in terms of population base rates, whereas the actual choice made by respondents was in regard to an individual patient. The literature on social cognition indicates that people often disregard base rate information when making judgments about individuals.²⁸ Thus, it is possible that a substantial number of respondents may have rejected the idea that the base rate information was germane to the case they were asked to consider. A minority of respondents did make comments explicitly indicating that they considered the choice to be a tradeoff; however, this provides only a lower bound because not making such a comment does not necessarily imply that the respondent did not see the choice as a tradeoff.

Another limitation to our study is that our scenarios were hypothetical. We did not ask the public to respond to what they would want for themselves (although some did indicate that as an explanation for their choice) or to respond directly to what they thought the physician ought to do, but rather what they would recommend if *they* were the physician in the scenario. In addition, our data were collected in only 1 city in the United States so our findings may not be representative of all regions. Finally, we did not formally estimate the response rate in this survey, although we have used the same methodology in the past and have typically achieved response rates of 80%. We also did not assess the extent to which the survey respondents understood the cost-effectiveness data provided, nor did we attempt to assess numeracy.

In conclusion, the public is an important stakeholder in the debate about whether physicians ought to be involved in the rationing of health care. Our study indicates, at a minimum, that there is not unanimous outrage among the public at the suggestion of physicians making cost-quality tradeoffs for individual patients. Qualitative analysis provided significant insights into the thought processes of survey respondents: although some respondents justified their decision based on the cost-effectiveness information provided, most focused instead on specific features of the patient or screening test in the scenario or on general beliefs about whether cost should be incorporated into clinical decisions. Further research is needed to clarify public values to inform public policies and physician decision making.

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APPENDIX A. Cancer Screening Scenarios

FAMILIAR SCENARIOS

Pap Smear Frequency

Imagine that Ms. Pratchett, a healthy 22-year-old with no family history of cervical cancer, comes to you for a routine visit. She has been married for 2 years and has had a negative Pap smear every year for the past 4 years. Her insurance covers the cost of cancer screening. You are considering 2 options—to recommend that Ms. Pratchett have a Pap smear every 3 years or every year. She asks you what you would recommend.

Among women like Ms. Pratchett, having Pap smears done every 3 years would cost \$17,425 to save each year of life. Having Pap smears done every year would cost \$782,500 to save each *additional* year of life not saved by having Pap smears every 3 years. The table below (Appendix B) describes how these numbers are calculated.

Colon Cancer—Imagine that Ms. Williams, a healthy 50-year-old with no family history of colon cancer, comes to you for a routine visit. Her insurance covers the cost of cancer screening. You tell Ms. Williams you are considering screening her for colon cancer. You have 3 screening tests available—fecal occult blood test (FOBT), flexible sigmoidoscopy, and colonoscopy. You are considering 3 possible options: 1) annual FOBT, 2) annual FOBT plus flexible sigmoidoscopy every 5 years, and 3) annual FOBT plus colonoscopy every 5 years. She asks you what you would recommend.

Among women like Ms. Williams, annual FOBTs would cost \$10,176 to save each year of life. Annual FOBTs plus flexible sigmoidoscopy every 5 years would cost \$71,636 to save each *additional* year of life not saved by using annual FOBTs alone. Annual FOBTs plus colonoscopy every 5 years would cost \$50,780 to save each *additional* year of life not saved by using annual FOBTs alone and \$45,727 to save each *additional* year of life not saved by using annual FOBTs plus flexible sigmoidoscopy. The table below (Appendix B) describes how these numbers are calculated.

Mammography—Imagine that Ms. Miller, a healthy 40-year-old with no family history of breast cancer, comes to you for a routine visit. Her insurance covers the cost of cancer screening. Because the risk of breast cancer increases with age, you are considering 2 options—to recommend annual mammography for Ms. Miller starting at age 50 or starting now. She asks you what you would recommend.

Among women like Ms. Miller, annual mammograms starting at age 50 would cost \$45,714 to save each year of life. Starting to screen at age 40 would cost \$159,219 to save each *additional* year of life not saved by starting to screen at 50. The table below (Appendix B) describes how these numbers are calculated.

UNFAMILIAR SCENARIOS

PapFinder—Ms. Wilson, a healthy 22-year-old with no family history of cervical cancer, comes to you for a routine visit. She has been married for 2 years and has not had a Pap smear in 3 years. All of her previous Pap smears were normal. Her insurance covers the cost of cancer screening. You are considering recommending regular Pap smears and are trying to decide whether to include a new laboratory technique called “PapFinder,” which improves the ability of the Pap test to detect abnormal cells. She asks what you would recommend.

Among women like Ms. Wilson, using regular Pap smears would cost \$17,425 to save each year of life. Using PapFinder would cost \$782,500 to save each additional year of life not saved by using Pap smears without PapFinder. The table below (Appendix B) describes how these numbers are calculated.

Unspecified Cancer—Imagine that Ms. Lawrence, a healthy 50-year-old with no family history of “cancer X,” comes to you for a routine visit. Her insurance covers the cost of cancer screening. You tell Ms. Lawrence you are considering screening her for cancer X. You have 3 screening tests available—tests A, B, and C. (For the purposes of this survey, assume that each is a blood test and that only one kind of test can be given.) She asks you what you would recommend.

Among women like Ms. Lawrence, test A would cost \$10,176 to save each year of life. Test B would cost \$71,636 to save each additional year of life not saved by using test A. Test C would cost \$50,780 to save each additional year of life not saved by test A and \$45,727 to save each additional year of life not saved by test B. The table below (Appendix B) describes how these numbers are calculated.

Gastric Cancer—Imagine that Ms. Sakura, a healthy 40-year-old who recently moved to the United States from Japan and has a family history of gastric cancer, comes to you for a routine visit. Her insurance covers the cost of cancer screening. Because the risk of gastric cancer increases with age, you are considering 2 options—to recommend annual gastric cancer screening for Ms. Sakura starting at age 50 or starting now. She asks you what you would recommend.

Among women like Ms. Sakura, annual gastric screening starting at age 50 would cost \$45,714 to save each year of life. Starting to screen at age 40 would cost \$159,219 to save each additional year of life not saved by starting to screen at 50. The table below (Appendix B) describes how these numbers are calculated.

APPENDIX B. Example of Tabular Cost-Effectiveness Data Provided to Study Participants: Colon Cancer Scenario

	Costs and Benefits of Screening Options (for Women Ages 50–75)		
	(A) Annual FOBT ^a	(B) Annual FOBT and Flexible Sigmoidoscopy Every 5 Years ^b	(C) Annual FOBT and Colonoscopy Every 5 Years ^c
Total cost per 1000 tested	\$231,000	\$625,000	\$1,663,000
Years of life saved per 1000 tested	22.7	28.2	50.9
Marginal cost per year of life saved	\$10,176 v. no screening	\$71,636 v. option (A)	\$50,780 v. option (A); \$45,727 v. option (B)

Note: FOBT = fecal occult blood testing.

^a At a total cost of \$231,000, annual FOBTs on average would cost $(\$231,000 \div 22.7) = \$10,176$ per year of life saved.

^b Conducting annual and flexible sigmoidoscopy every 5 years, the additional cost would be $(\$625,000 - \$231,000) = \$394,000$ and $(28.2 - 22.7) = 5.5$ additional years of life would be saved at a cost of $(\$394,000 \div 5.5) = \$71,636$ per additional year of life saved.

^c Compared to option (A), the additional cost of annual FOBTs plus colonoscopy every 5 years would be $(\$1,663,000 - \$231,000) = \$1,432,000$ and $(50.9 - 22.7) = 28.2$ additional years of life would be saved at a cost of $(\$1,432,000 \div 28.2) = \$50,780$ per additional year of life saved. Compared to option (B), the additional cost of annual FOBTs plus colonoscopy

every 5 years would be $(\$1,663,000 - \$625,000) = \$1,038,000$ and $(50.9 - 28.2) = 22.7$ additional years of life would be saved at a cost of $(\$1,038,000 \div 22.7) = \$45,727$ per additional year of life saved.

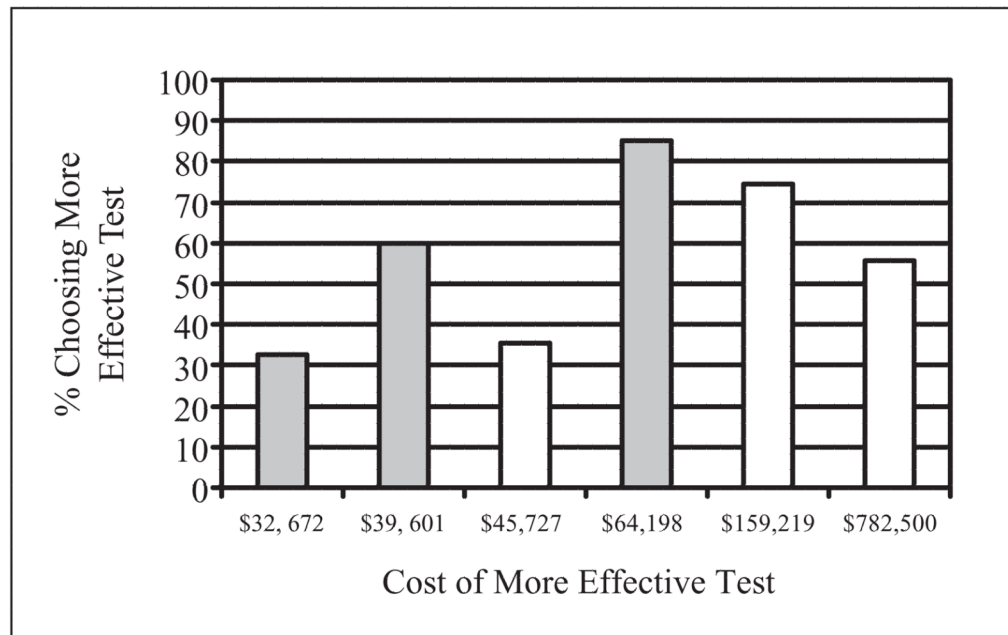


Figure 1. Relationship between cost/year of life saved and percentage of respondents choosing more effective test: average cost-effectiveness data (compared with no screening) and incremental cost-effectiveness data (compared with less effective test).

Table 1

Six Cancer Screening Scenarios

Cancer Type	Least Effective Test	Cost-Effectiveness of Least Effective Test ^a		Most Effective Test	Cost-Effectiveness of Most Effective Test		% Respondents Choosing Most Effective Test	
		Effective Test ^a	Incremental ^b		Average ^a	Incremental ^b	Average	Incremental
Colon	Annual FOBT	\$10,176	\$45,727	Colonoscopy every 5 years	\$32,672	\$45,727	29	28
Unspecified	Test A	\$10,176	\$45,727	Test B	\$32,672	\$45,727	36	43
Cervical	Pap smear every 3 years	\$17,425	\$782,500	Pap smear every year	\$39,601	\$782,500	77	72
Cervical	Routine Pap smear	\$17,425	\$782,500	“PapFinder”	\$39,601	\$782,500	43	39
Breast	Mammogram at age 50	\$45,714	\$159,219	Mammogram at age 40	\$64,198	\$159,219	85	74
Gastric	Screen at age 50	\$45,714	\$159,219	Screen at age 40	\$64,198	\$159,219	85	75

Note: FOBT = fecal occult blood testing.

^aCost/year of life saved compared with no screening.

^bCost/year of life saved compared with using the least effective test.

Table 2

Relationship of Screening Recommendation to Juror Demographic Characteristics

	<i>n</i>	% Recommending Less Expensive Test	<i>P</i> -Value ^a
Sex			0.022
Female	460	42	
Male	236	51	
Age			<i>ns</i>
< 35	183	49	
35–44	196	43	
45–54	173	48	
≥55	229	40	
Education			0.020
< 16 years	467	59	
≥16 years	314	50	
Race			<i>ns</i>
African American	285	42	
White	349	47	
Latino	23	61	
Asian/Pacific Islander	12	33	
Other	14	29	

^aUsing chi-squared tests.

Table 3Explanations Given by Respondents Choosing More Effective Test (*n* = 358)

Explanation	% ^a	Examples
Test is better	39	Early cancer detection saves lives. I feel that the test that can provide the most accurate results should be used. It would add years to her life.
Life is priceless	22	A year of life should not be measured in terms of money. There is no price on human life. How can you worry about money when lives are at stake?
Risk significant	20	Any type of family history is the perfect reason to start treatment. When women become 40 and over, they tend to have more medical problems. Cancer is becoming more prevalent.
Benefit > cost	8	It's worth the money to obtain peace of mind. The additional cost for saving lives is worth it.
Personalizing	6	I would like to live as long as possible. Doesn't everyone want to live as long as possible without some doctor telling you not to have a test? I have enough problems with my own HMO!
Insurance pays	5	She should be tested for the best because she pays for her coverage.
Prevention cheap	5	Providing mammograms at 40 would decrease the amount spent on treatment if not detected early.
Physician duty	3	A doctor cannot look at the overall picture but must look only at the patient and their individual history. I would recommend every year for the patient's well-being. That's what doctors are supposed to do for their patients.

^aPercentage may add to more than 100 because some responses fell into more than 1 category.

Table 4Explanations Given by Respondents Choosing Less Effective Test (*n* = 310)

Explanation	% ^a	Examples
Insignificant risk	40	I do not feel screening options are very beneficial unless the person exhibits certain risk factors. This is a healthy 22-year-old woman with no family history of cervical cancer. No symptoms are given, so why test?
Test is good enough/better	13	The baseline test appears to be sufficient. Every 3 years should be okay. Any abnormalities are usually found on a regular Pap smear.
Cost > benefit	12	The cost of screening at age 40 would cost significantly more money for an additional 6.4 years. The benefits of PapFinder do not compensate for the higher costs.
Costs too much	9	I would choose the least costly test. I feel this would be an unnecessary cost.
Resources are limited	7	Unless some cutbacks are made in the health care system, it will collapse. We need to keep the cost of medical insurance down. There is no way to pay for this as a society ... if we've got this kind of money, perhaps we can spend it on domestic abuse shelters or expanding free prenatal care.
Life is priceless/physician duty	4	Saving life is the most important thing. However, since there is no indication of any problems, I would just do the regular Pap smear.

^a. Percentage may add to more than 100 because some responses fell into more than 1 category.