

# Willingness To Pay To Shorten Waiting Time For Cataract Surgery

What are the preferences of people actually on the waiting list for surgery?

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**ABSTRACT:** We interviewed persons who had recently been placed on a public waiting list for cataract surgery in Manitoba, Canada; Barcelona, Spain; and Denmark. The majority of the respondents were unwilling to pay higher taxes to reduce the length of the waiting list or to pay more out of pocket to have the surgery performed earlier in the private sector. Less than 2 percent actually had the surgery done in the private sector. We conclude that in spite of expressed public dissatisfaction with waiting lists in all three sites, a majority of the respondents did not support the actions that could have reduced their own wait.

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WAITING LISTS FOR ELECTIVE SURGERY are common in many countries. Because waiting lists are often unpopular, countries have developed a variety of initiatives to reduce the total number of people on the waiting list. Some countries have increased funding in the public sector, others have subsidized care in the private sector, while still others have developed priority-setting methods to determine which patients are in the greatest need.<sup>1</sup> Evaluations of these initiatives suggest that they have met with varying levels of success.<sup>2</sup>

So far, nobody has investigated the preferences of patients who are actually on waiting lists. Would these persons be willing to pay higher taxes to shorten the waiting list for publicly funded care? Would some be willing to pay out of their own pockets to receive care in a private clinic if the wait was less than one month? Is waiting more onerous for certain persons than for others?

Here we examine the extent to which candidates for cataract

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surgery in Manitoba, Canada; Barcelona, Spain; and Denmark are willing to pay out of pocket to reduce waiting time for surgery. Willingness-to-pay questionnaires are one method for eliciting information on people's preferences, and they have been used to examine a variety of public policy issues.<sup>3</sup> We selected cataract surgery because it is an elective procedure that has a waiting list in many countries.

**Survey design.** Data were collected as part of an International Patient Outcomes Research Team (IPOINT) study to examine outcomes of cataract surgery in the United States; Manitoba, Canada; Denmark; and Barcelona, Spain. We excluded the United States from this analysis. Patients scheduled for cataract surgery were recruited consecutively from thirty-nine ophthalmology practices or hospital departments in the three study sites.<sup>4</sup> Patients scheduled for first-eye cataract surgery were eligible for enrollment in this study if they were age fifty or older, were living within a designated recruitment area, and were not scheduled for a combined procedure. Patients who were deaf, were confused, did not speak the primary language of the study site, did not have access to a telephone, or did not give informed consent were excluded.

Each patient was given a baseline clinical appraisal by a surgeon or ophthalmologist who enlisted the patient for cataract surgery and recorded data about the patient's visual status on a standardized form. Telephone interviews were conducted with patients shortly after enlistment to obtain information about patients' initial visual function, health status, and demographic characteristics. Initial baseline data were collected between September 1992 and May 1994 in the three locations. Patients were then followed until their first-eye surgery was completed, and a follow-up interview was conducted four months following surgery.

Patients were included in this analysis if they had both clinical and interview baseline data and participated in a four-month follow-up interview. We only included patients who were originally scheduled for surgery in publicly funded settings and who had an anticipated waiting time of at least one month.<sup>5</sup>

The variables examined were suggested, in part, by previous studies on queuing for elective surgery.<sup>6</sup> The following variables were measured at the baseline assessment (Exhibit 1): (1) Clinical visual status—best corrected Snellen acuity was measured by patients' ophthalmologists. (2) Visual function and symptoms—functional impairment related to vision was assessed using the VF-14 Index, a reliable and valid self-reported measure of difficulty in performing fourteen vision-dependent activities.<sup>7</sup> A cataract symptom score (CSS) was used to assess patients' self-reported degree of bother associated with six cataract-related symptoms.<sup>8</sup> (3) Sociodemographics—age, sex,

household composition, education level, paid or volunteer work status, and household income were considered as potentially important variables. A translation-back-translation method (the instrument was translated, then translated back into English until the language was equivalent in all three languages) was used to assure linguistic equivalence, and each of the questions was analyzed for cultural equivalence.<sup>9</sup>

We obtained a total of 464 responses to the waiting time and willingness-to-pay questions. For each of the variables, with the exception of the cataract symptom score, the differences among the three sites were statistically significant ( $p \leq .05$ ).<sup>10</sup>

## Study Results

**Willingness to pay higher taxes.** Some countries have allocated additional public resources to shorten the queue. As patients were placed in the queue, we asked them whether they favored higher income taxes to eliminate waiting times.<sup>11</sup> There was limited support for higher taxation: 12.3 percent of respondents from Barcelona, 23.9 percent from Denmark, and 14.9 percent from Manitoba (not shown). The remainder either said that they were unwilling or (in Denmark) did not know if people should pay higher taxes.

**Willingness to pay for care.** In all three locations, patients can go to a private clinic and pay out of pocket to have a cataract extraction performed within a shorter time. We asked the respondents if they had ever heard of private clinics for cataract surgery; 100 percent of

### EXHIBIT 1 Characteristics Of Respondents

Variable	Barcelona	Denmark	Manitoba	p value
Number of respondents	74	256	134	
Mean age (years)	70.9	73.3	71.3	*
Percent female	50.0%	67.6%	64.2%	*
Percent living alone	16.2%	50.0%	32.1%	**
Percent with 8 or more years of education	12.3%	54.9%	85.8%	**
Percent working or volunteering outside home	8.1%	20.8%	23.1%	*
Mean household income (U.S. dollars)	\$11,233	\$26,206	\$22,388	**
Mean VF-14 score	65.3	76.5	71.6	**
Percent with visual acuity 20/80 or worse in better eye	48.7%	8.6%	9.8%	**
Percent with history of other eye disease	28.4%	21.1%	40.3%	**
Mean cataract symptom score	5.2	6.1	5.0	— <sup>a</sup>
Mean anticipated waiting time (months)	3.8	5.7	5.9	**

**SOURCE:** International Cataract Patient Outcomes Research Team.

<sup>a</sup> Not statistically significant.

\* .01 <  $p \leq .05$     \*\*  $p < .01$

Barcelona respondents, 89.8 percent of Danish respondents, and 63.4 percent of Manitoba respondents were aware of private clinics. We also asked the respondents if patients should be permitted to pay physicians directly to shorten their waiting times for surgery. In Manitoba, 44.8 percent said it was acceptable, compared with 25.7 percent in Barcelona and 9.4 percent in Denmark (not shown).

We then asked if persons would pay a specific amount out of pocket to reduce scheduled waiting times for cataract surgery to less than one month.<sup>12</sup> The out-of-pocket cost of having cataract surgery performed in a private clinic in all three locations is approximately \$1,000 per eye.<sup>13</sup> We randomly asked one-quarter of the respondents if they were willing to pay \$500, one-half if they were willing to pay \$1,000, and one-quarter if they were willing to pay \$2,000.<sup>14</sup> One month is the approximate wait to have the surgery performed in the private sector. As the out-of-pocket price increased, the percentage of respondents willing to pay declined (Exhibit 2).<sup>15</sup>

When the respondents were placed on a waiting list to have a cataract extraction performed, they anticipated waiting from one to eighteen months for the surgery. There was a greater willingness to pay to reduce waiting time to less than one month as the anticipated waiting time increased.<sup>16</sup> The one exception is Barcelona; however, only ten of seventy-four respondents in Barcelona had a scheduled waiting time of seven months or longer.

A number of factors in addition to price and expected wait could influence a patient's willingness to pay to have cataract surgery done within a month. We used logistic regression to determine if any of several factors were associated with a greater willingness to pay to have cataract surgery performed within one month. The results suggest that a higher education level, longer anticipated waiting time, poorer visual acuity in the better eye, and a higher cataract symptom score are all associated with a greater willingness to pay.<sup>17</sup>

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**EXHIBIT 2  
Respondents Willing To Pay To Have Cataract Extraction Performed Within One Month  
At Different Out-Of-Pocket Prices And For Different Waiting Times**

	Barcelona	Denmark	Manitoba
Price			
\$500	28.6%	16.9%	38.2%
\$1,000	25.0	11.7	15.3
\$2,000	23.1	11.1	7.1
Anticipated wait			
1-6 months	26.6	11.2	17.6
7 months or more	20.0	16.7	23.3

**SOURCE:** International Cataract Patient Outcomes Research Team.

Respondents who completed the eighth grade were more willing to pay than were persons with less education. Education level is often associated with a number of socioeconomic variables and may be associated with a person's opportunity cost of waiting. In a sample of mostly retired persons, education level may be a better proxy than household income to assess the cost of waiting time. The association between the longer anticipated waiting time, poorer visual acuity, and high cataract symptom score with greater willingness to pay may reflect the degree of frustration and concern that these persons feel about their cataracts. Age, sex, living alone, working or volunteering outside of the home, household income, scheduled waiting time, VF-14 score, and presence of other eye disease were all statistically insignificant predictors of willingness to pay. The price required to shorten the length of the wait to less than one month was statistically significant (1.00 odds ratio), but the coefficient was so small that it did not change the odds ratio in the hundredths place.

When other factors were controlled for, respondents from Barcelona were more willing to pay than were respondents from either Denmark or Manitoba, although the result was not statistically significant at the 0.05 level. For many years Barcelona has encouraged the development of private clinics as a means for reducing the waiting times in public hospitals. Approximately 30 percent of the Barcelona citizens have private insurance that in most cases pays for services outside the public system. In addition, it is possible to receive care in Barcelona in a private clinic and have the cost paid by the public insurance system.<sup>18</sup>

Waiting lists have become a major political issue in Denmark; the government recently devoted additional public resources to shorten the waiting lists for cataract surgery and other elective procedures. Our survey results could cast light on the rationale for their political decision. The average cataract patient in Denmark was waiting longer than he or she expected to wait. This probably led to the greater dissatisfaction about waiting expressed after surgery by the Danes than was found among respondents from Manitoba or Barcelona. Combining this information with the finding that Danes were the most willing to pay higher taxes to reduce waiting times and were the least willing to allow persons to pay physicians directly to allow them to jump the queue could help to explain why the Danes are more willing to devote additional public resources to reduce the wait in the public system.

Respondents from Manitoba were the most tolerant of a situation in which a patient could pay a physician directly to shorten waiting time, although this was acceptable to only 45 percent of the respondents. Furthermore, only 15 percent indicated a willingness to pay

the current market price to shorten their personal waiting time. At entry to the queue, Manitoba respondents were the least aware of private-sector options, and only 15 percent were willing to pay higher taxes to eliminate the queues.

**Follow-up.** We interviewed cataract surgery patients four months after the extraction was performed. Patients waited an average of 0.2 months longer than they expected to wait in Barcelona, 0.9 months longer in Denmark, and 0.6 months less in Manitoba. In spite of having generally waited the predicted time or slightly longer than they had expected, when they were asked if the wait was reasonable four months following the extraction, 31.4 percent of the respondents from Barcelona, 37.2 percent in Denmark, and 25.7 percent in Manitoba reported that the wait was longer or much longer than they would have preferred. This suggests that some dissatisfaction with waiting persists after persons have undergone the surgery.

**Actual behavior.** In all three locations persons who are willing to pay out of pocket can have the surgery performed in a private clinic. Data constraints do not permit an exact count of the number of patients in the three locations who chose this option. Estimates are that 40 percent of the cataract surgeries in Barcelona and 15 percent in Denmark are performed privately; the percentage in Manitoba is unknown.<sup>19</sup> In spite of most respondents' knowledge that private clinics were available in all three locations, only eight of 464 patients originally scheduled for surgery in a public clinic actually jumped the queue and had the surgery performed in a private clinic.

One of the criticisms of willingness-to-pay questionnaires is that persons would not actually behave in the same way in which they respond to the questionnaire. Although 25 percent of respondents from Barcelona, 15 percent from Manitoba, and 12 percent from Denmark expressed a willingness to pay the market price to reduce the queue to less than one month, only 1.7 percent actually did. There are a number of potential reasons for the apparent inconsistency. (1) Patients may not have found waiting as onerous as they anticipated when they were originally placed in the queue, although responses to the interview at four months following surgery suggest that approximately one-third of respondents waited longer or much longer than they would have preferred. (2) Patients may have been unaware of specific private clinics, although the majority of patients were aware of private clinics when they entered a queue, and virtually all respondents were aware of private clinics when surveyed four months following the surgery. (3) Clinicians may have used open slots to respond to patients reporting the greatest need. There is some evidence for this hypothesis in queuing for coronary surgery.<sup>20</sup> (4) The actual prices faced by patients may have been higher

*“We found greater willingness to pay as the length of an anticipated wait increased.”*

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than we estimated. In Barcelona, for example, there is considerable variation around the average out-of-pocket cost of \$1,000 per eye. (5) Patients may not have wanted to change physicians, which could be required if they sought care in a private clinic. (6) Travel times may have been greater to private than to public facilities, since there were relatively few private clinics in Manitoba and Denmark.

**Generalizability.** It is impossible to generalize the results from this study to other geographic locations, other clinical conditions, or even the entire population in these geographic areas. We cannot, for example, use these data to forecast how Americans would respond to queuing.

Critics of willingness-to-pay questionnaires have identified a number of potential biases that could occur.<sup>21</sup> One potential bias is that persons have an incentive to misrepresent their responses in order to please the interviewer or for their own benefit. We do not believe, however, that these respondents were attempting to do either, since the interviews were conducted outside of the clinical setting and interviewers explicitly told respondents that their responses were not related to their treatment.

A second category of biases are starting-point biases. It is common in willingness-to-pay questionnaires to begin the process of determining a person's willingness to pay by starting with a very low or a very high price and gradually raising or lowering the price. In this instance, we knew the approximate market price for the service and therefore focused on the actual price in the marketplace. This, however, could have led to starting-point bias.

A third type of bias is scenario misspecification. The questionnaire asked a straightforward question—whether a person would be willing to pay a specific amount to reduce waiting time to less than one month.<sup>22</sup> A fourth potential bias is sample design. According to the willingness-to-pay literature, it is critical to elicit responses from people who could benefit from the service.<sup>23</sup> Because our sample frame contained persons who knew that they would benefit directly if waiting times were shorter, respondents were more likely to be willing to pay higher taxes. Thus, the responses from these persons could contain some upward bias.

## **Conclusion**

The existence of waiting lists is often cited by U.S. policymakers

as a reason to explain why the United States should not adopt the health care systems of other countries. In this DataWatch we examined the preferences of persons in three countries with waiting lists to determine their willingness to pay to shorten or eliminate the waiting list. We found greater willingness to pay as the length of an anticipated wait increased. Willingness to pay was also greater for persons with more education, lower visual acuity, and more bother associated with their vision.

There was limited support for increasing the level of taxation to reduce the queue. There was also limited support for paying out of pocket to reduce waiting times. At the approximate market price for having the surgery performed privately, 25 percent of respondents in Barcelona, 15 percent in Manitoba, and 12 percent in Denmark expressed a willingness to pay to have the surgery performed within a month. At half the approximate market price, a majority of the respondents in these locations were still not willing to pay to have the surgery performed privately in any location. In all three locations the respondents had the option of paying out of pocket and having the surgery performed in a private clinic. Less than 2 percent of the respondents actually selected this alternative, which suggests a tolerance for waiting lists among patients in the public system.

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Although the overall pattern of responses was similar across the three locations, cultural and political differences appear to have played a role in how persons responded to waiting lists. For example, respondents from Manitoba were more tolerant than were those from Barcelona or Denmark of allowing patients to pay out of pocket to reduce their waiting times. Danish respondents were more likely to favor increased taxation than to allow out-of-pocket payments by patients. These findings suggest that each country will develop a different response to waiting lists based upon culture and politics.

In the United States, managed care organizations typically have lower deductibles and coinsurance rates than indemnity insurers have. With lower levels of cost sharing, it can be anticipated that the demand for health care services will be greater. Other countries have used waiting lists to control the demand for services, with some success. Some managed care organizations in this country could begin to use waiting lists to constrain the demand for services, although it is also possible that they would prove too unpopular in the marketplace.

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## NOTES

1. C.D. Naylor, "A Different View of Queues in Ontario," *Health Affairs* (Fall 1991): 110-128; S.J. Katz, H.F. Mizgala, and H.G. Welch, "British Columbia Sends Patients to Seattle for Coronary Artery Surgery," *Journal of the American Medical Association* 266, no. 8 (1991): 1108-1111; J.G. Cullis and P.R. Jones, "National Health Service Waiting Lists: A Discussion of Competing Explanations and a Policy Proposal," *Journal of Health Economics* 4 (1985): 119-135; and C.E.B. Frost and B.J. Francis, "Clinical Decision Making: A Study of General Surgery within Trent RHA," *Social Science and Medicine* 13A (1976): 193-198.
2. C.M. Lindsay and B. Feigenbaum, "Rationing by Waiting Lists," *American Economic Review* 74, no. 3 (1984): 404-417; A. Street and S. Duckett, "Are Waiting Lists Inevitable?" *Health Policy* 36 (1996): 1-15; M. Hanning, "Maximum Waiting Time Guarantee: An Attempt to Reduce Waiting Lists in Sweden," *Health Policy* 36 (1996): 17-35; C.D. Naylor et al., "Queuing for Coronary Surgery during Severe Supply-Demand Mismatch in a Canadian Referral Centre: A Case Study of Implicit Rationing," *Social Science and Medicine* 37, no. 1 (1993): 61-67; S. Frankel and R. West, eds., *Rationing and Rationality in the National Health Service: The Persistence of Waiting Lists*, Economic Issues in Health Care (London: Macmillan, 1993), 157-170; R. Mulgan and R.L. Logan, "The Coronary Bypass Waiting List: A Social Evaluation," *New Zealand Medical Journal* 103 (1990): 371-372; C.D. Naylor et al., "Waiting for Coronary Revascularization in Toronto: A Year's Experience with a Regional Referral Office," *Canadian Medical Association Journal* 149, no. 7 (1993): 955-962; and C.D. Naylor, K. Sykora, and S.B. Jaglal, "Waiting for Coronary Artery Bypass Surgery: Population-Based Study of 8,517 Consecutive Patients in Ontario, Canada," *Lancet* 346, no. 8990 (1995): 1605-1609.
3. G.C. Morrison and M. Gyldmark, "Appraising the Use of Contingent Valuation," *Health Economics* 1 (1992): 233-243; and D.S. Brookshire et al., "Valuing Public Goods: A Comparison of Survey and Hedonic Approaches," *The American Economic Review* 72, no. 1 (1982): 165-177.
4. All seventeen hospital departments agreed to participate in Denmark; all practicing ophthalmologists were asked to participate in Manitoba, and seven of twelve agreed to participate; and a random sample of public hospital departments were recruited in Barcelona.
5. A total of 546 patients were contacted and 501 signed an informed consent agreeing to participate in the study. The sample size for this paper was 464 because we required the patients to remain in the study for a four-month follow-up to be included in this data set.
6. Naylor et al., "Queuing for Coronary Surgery;" Mulgan and Logan, "The Coronary Bypass Waiting List;" Naylor et al., "Waiting for Coronary Revascularization in Toronto;" and C.D. Naylor et al., "Placing Patients in the Queue for Coronary Surgery: How Do Age and Work Status Affect Consultants' Decisions?" *Journal of General Internal Medicine* 7 (1992): 492-498.
7. E.P. Steinberg et al., "The VF-14 Index: An Index of Functional Impairment in Patients with Cataract," *Archives of Ophthalmology* 112 (1994): 630-638. VF-14 scores potentially range from 0 to 100, with lower scores indicating poorer functional ability.
8. The six cataract-related symptoms are distorted vision, glare or halo, blurry vision, brightness distortion, color distortion, and recent worsening of vision. The number of symptoms and their associated degree of bother, from "a little" to "very bothered," were summed for each patient, resulting in a range of scores from 0 (no symptoms) to 18 (very bothered by all six symptoms).
9. G. Anderson et al., "Analyzing Health Outcomes through International Comparisons," *Medical Care* 32, no. 5 (1994): 526-534.
10. Compared with respondents from Manitoba and Denmark, respondents from

Barcelona were more likely to be younger, be male, have a limited educational experience, and have lower incomes; were less likely to live alone and to work or volunteer outside of their home; and had worse measures of visual acuity and visual functioning. Respondents from Denmark and Manitoba demonstrated greater similarity in their characteristics; however, Danish respondents were more likely to live alone and have higher incomes, while respondents from Manitoba were more likely to have a history of other eye disease and to have a higher level of education.

11. The specific wording of the question is, "Do you think people should pay higher taxes in order to eliminate the waiting times for surgery?"
12. The specific wording is, "If patients had the opportunity to pay out of pocket to reduce their waiting times for cataract surgery, do you think you would have chosen to pay \$X (per eye) to reduce your waiting time to less than one month?"
13. We used 1993 purchasing power parities to convert the currencies of other nations to U.S. dollars. Organization for Economic and Community Development, *OECD Health Data: Comparative Analysis of Health Systems, 1995* (Paris: OECD, 1995), 1-136.
14. We chose to center the dollar-threshold questions on the usual cost of obtaining cataract surgery instead of the more conventional technique used in willingness-to-pay questionnaires of starting at a very low rate or very high rate and trying to elicit a crossover point. This was done to minimize the number of questions and to make the price seem more realistic. We recognize that this could have introduced some starting-point bias.
15. The price elasticity was statistically significant ( $p = 0.002$ ) for Manitoba and not statistically significant for Barcelona ( $p = 0.709$ ) or Denmark ( $p = 0.325$ ).
16. None of the values was statistically significant at the  $p < 0.05$  level.
17. Full regression results are available from the authors. Contact Gerard Anderson, Director, Center for Hospital Finance and Management, Room 300, Hampton House, 624 North Broadway, The Johns Hopkins University, Baltimore, MD 21205. All of the variables are entered as continuous variables except when explicitly defined as a categorical variable.
18. C. Borrell, I. Pasarin, and A. Plansencia, *Enquesta de Salut de Barcelona, 1992-1993* (Health Interview of Barcelona) (Barcelona: Estadistiques de Salut no. 23, Ajuntament de Barcelona, 1995).
19. *Ibid.*; and H. Sigmund and B. Danneskiold-Samsoe, *Operation af grå stær på sygehus og i praksis* (DSI Report 92.01, Copenhagen, Denmark).
20. Mulgan and Logan, "The Coronary Bypass Waiting List;" Naylor et al., "Waiting for Coronary Revascularization in Toronto;" and Naylor et al., "Waiting for Coronary Artery Bypass Surgery."
21. D.M. Berwick and M.C. Weinstein, "What Do Patients Value? Willingness to Pay for Ultrasound in Normal Pregnancy," *Medical Care* 23, no. 7 (1985): 881-893; M. Johanneson, B. Jonsson, and L. Borgquist, "Willingness to Pay for Antihypertensive Therapy: Results of a Swedish Pilot Study," *Journal of Health Economics* 10 (1991): 461-474; B. O'Brien and J.L. Viramontes, "Willingness to Pay: A Valid and Reliable Measure of Health State Preference?" *Medical Decision Making* (July-September 1994): 289-297; D. McFadden, "Contingent Valuation and Social Choice," *American Journal of Agriculture and Economics* 76 (1994): 689-708; and T.A. Cameron and M.D. James, "Estimating Willingness to Pay from Survey Data: An Alternative Pre-Test Market Evaluation Procedure," *Journal of Marketing Research* 29 (1987): 389-395.
22. See Note 11.
23. R.C. Bishop and T.A. Heberlein, "Measuring Value of Extramarket Goods: Are Indirect Measures Biased?" *American Journal of Agriculture and Economics* 22, no. 3 (1979): 926-930.