

Prevention Just in Case or Treatment Just Because: Measuring Societal Preferences

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Since the turn of the century, both prevention and treatment efforts have been credited with substantially improving the quality of life and life expectancy of the US population.¹ Water sanitation, housing codes, nutrition guidelines and occupational safety standards are but a few examples of successful prevention efforts for promoting health and preventing disease or injury. Clinical and pharmacological interventions for individuals with pre-existing conditions, such as chemotherapy for reducing the spread of cancers, are examples of successful treatment efforts. Together, prevention and treatment activities have improved our nation's health. If we want their complementary roles to continue improving our nation's health, we need even closer collaboration between public health practitioners and clinicians, the stewards of prevention and treatment, respectively.

To say that prevention and treatment activities complement one another belies the fact that they also compete for limited health care resources. The reality is that the demand for these resources has increased, while objective approaches to health care cost containment have failed. New and existing prevention and treatment efforts are now forced to compete for scarce health care resources—there are limits to what we as a society can spend when there are other social goods competing for finite public dollars. Thus, the rationing of health care is inevitable. We see rationing decisions made by governments. State governments, for example, must choose which prevention or treatment benefits will be covered by their Medicaid programs. States also must choose which populations will receive these benefits. We see rationing decisions made by health plans. For example, these plans place spending and utilization caps

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on prevention and treatment health care required for mental health conditions.

The rationing decisions made by governments, health plans and other non-public entities are topics of considerable debate.²

³ Who should determine what counts as a fair allocation of limited resources? And when forced to choose between prevention and treatment interventions, how should we make these rationing decisions?

From an objective perspective, allocating limited resources between prevention and treatment should be based on informed, comparative evaluation of benefits and costs, as in benefit-cost analysis.⁴ But when competing for limited funding in this regard, it is likely that programs that reduce future risks, such as prevention, will be discounted in favor of programs that reduce current risks, such as treatment.⁵⁻⁶ Treatment interventions yield both costs and benefits immediately. Angioplasty, for example, which is the removal of occlusions in cardiac arteries by inserting and expanding a balloon through a catheter, re-opens the blood pathways instantly and is an excellent example of simultaneous realization of both costs and benefits for the individual. Prevention interventions, on the other hand, have immediate costs, while their benefits may be delayed. Childhood vaccinations, for example, yield a cost realized at the time of inoculation. However, the benefits of illness reduction and increased productivity are realized over the entire life of the child. Therefore, it may be that the temporal realization of outcomes in prevention and treatment interventions does not lend itself well to head-to-head comparisons using benefit-cost analysis.

We must also consider who should be making these allocation decisions be-

tween prevention and treatment interventions. Should society yield decisions about limited resources to governments and third-party payers? Fleck² argues that by virtue of health care rationing being fundamentally a moral and political problem, rationing decisions should be made democratically. He denies that economic, organizational or technological problems are a basis for health care rationing, and, therefore, a democratic decision-making process that incorporates individuals' preferences is the only acceptable approach to rationing. He goes on to state that objective measures for making decisions, such as benefit-cost analysis, while legitimate in their approach, ultimately rest upon moral premises. As such, it is essential that these moral premises be explored through an explicit process of assessing individual preferences that lead to democratic consensus. Sen,⁷ in his treatise on the possibility of social choice, similarly argues that society should choose to make health care rationing decisions that are aligned with socially accepted preferences. An exploration of socially accepted preferences for prevention and treatment, therefore, is warranted.

This paper presents past evidence regarding societal preferences for prevention and treatment, new data about how those preferences impact willingness to pay for health interventions and a qualitative analysis of attributes that most influence societal preferences for prevention versus treatment.

Research on Preferences for Prevention versus Treatment

Several authors have explored stated individual preferences for prevention versus treatment, with varying results. Johannesson and Johansson, for example, asked a Swedish population to make a dichotomous choice between saving lives through a prevention or acute care scenario.⁸ The authors speculated that a treatment preference would exist because of a desire to save lives among individuals already suffering from disease for equity reasons; in other words, improving the health of people in poorer health states should be given a higher priority than improving health states of people in good health.

Their results did not support the equity hypothesis, however. When the number of lives saved was held constant between the two choices (i.e. saving 100 lives each), the authors found that 61% of the sample population favored the prevention program. Their analyses suggest that the median number of lives saved in an acute care setting judged to be equivalent to saving one life through prevention is 1.2 to 1.4. In other words, the authors found approximately an equal weighting between prevention and treatment, with a slight (if not insignificant) weighting towards prevention.

An alternative explanation the authors provided for greater prevention preferences was that saving lives through prevention can be expected to be of higher quality and longer duration than lives saved by treatment among individuals already suffering from disease. Certainly this depends on the

disease and the effectiveness of the treatment in question, which the authors do not discuss. Most importantly, the study included a dichotomous choice question only, with no qualitative follow-up as to why respondents preferred one health care option over the other. Therefore, one is left to speculate about the respondents' choices.

Ubel and colleagues also found a slight preference for prevention over treatment in a similar study.⁹ They asked respondents to make a policy choice between two programs designed to influence the functional ability of nursing home residents with varying levels of disability. Respondents could choose between one program that improved health (treatment) or another program that prevented decline (prevention). When costs and benefits were held constant, a plurality of respondents chose the prevention program over the treatment program (37% versus 21%, $p=0.002$).

When strength of preference was incorporated, however, the preference for prevention was no longer statistically significant. The authors note:

[A]ny attempt at measuring preferences for prevention versus treatment through surveys should be cautioned because attitudes towards prevention and treatment are complex. In the abstract, it might be easy to favor prevention because it seems better to avoid an illness altogether than to be cured by an illness. But in reality, it is hard to divert resources away from people who have existing illnesses.⁹

While these arguments are suggestive, Ubel and colleagues, like Johannesson and

Johansson before them, do not attempt to prove their hypotheses with empirical evidence.⁸⁻⁹

Subramanian and Cropper, on the other hand, qualitatively explored societal preferences for program choices in the realm of public health and environmental health, although not for prevention versus treatment per se.¹⁰ In a random digit dial telephone survey, more than 1,000 US residents were asked to make choices between a number of life-saving programs. The authors found that when the number of lives saved was equal, a majority of respondents favored environmental health interventions that were more treatment oriented over public health interventions that were more prevention oriented (range 54% to 72% across six pairs, $p < 0.01$). For example, a majority of respondents chose an industrial air pollution program designed to treat the problem of air pollution (55%) over a smoking education program designed to prevent smoking (45%). Likewise, a majority of respondents chose a drinking water pollution control program designed to treat the problem of water pollution (54%) over a colon cancer screening program designed to prevent cancer from becoming too widespread in the body (46%).

Their findings are significant for our understanding of societal preferences for prevention versus treatment because they qualitatively explored, through a series of open-ended questions, the effect of certain program attributes on program choice. At the outset, they found that several program characteristics other than the number of lives saved influenced program choice. Notably, variables indicating which program the respondent thought was more

costly were of less significance. If a respondent identified "other benefits" from a program besides the number of lives saved, then the probability of choosing that program significantly increased. For the treatment-oriented environmental programs, other benefits included those that were global (reduced ozone depletion) and local (cleaner air or water). For the public health interventions that were prevention-oriented, other benefits included reductions in illness/injury, saving of health care costs, and increased awareness about health risks. These results hint at the underlying causes for certain prevention and treatment preferences, but, unfortunately, Subramanian and Cropper provide few details as to the magnitude or specifics of these preferences for other benefits.

Corso et al. explored an alternative measure of preferences for prevention and treatment.¹¹ We assessed societal "willingness to pay" (WTP) for a hypothetical prevention scenario and a hypothetical treatment scenario in two separate samples. In a random digit dial telephone survey of over 1,100 adults in the United States, we found that persons randomized to the hypothetical treatment scenario were willing to pay significantly more (\$665) than persons randomized to the hypothetical prevention scenario (\$223), even though benefits (a reduction in mortality risk of 2 in 100,000) were held constant.

In addition to responding to WTP questions, respondents were also asked to state their opinions about the relative effectiveness and costliness of prevention versus treatment interventions in general. There was little difference in perception of effectiveness between prevention and treatment: 30.2% of respondents stated

that treatment was more effective; 38.3% stated that prevention was more effective; and 31.5% stated that prevention and treatment interventions were equally effective. The majority of respondents also stated that prevention was less costly than treatment in general (75.1%). However, prior opinions about relative effectiveness and costliness of options under consideration had little, if any, effect on WTP for the hypothetical treatment or prevention scenarios. For the group randomized to the hypothetical prevention scenario, for example, WTP increased only modestly ($p=0.0542$) as the general perception that prevention programs are more effective than treatment programs increased. For the group randomly assigned to the hypothetical treatment scenario, WTP increased even less significantly ($p=0.1037$) as the general perception that treatment pro-

grams are more effective than prevention programs increased. Prior perceptions of relative costliness had no significant effect on WTP in either group, a finding similar to that of Johannesson and Johannsson.⁸

New Findings

However, other data collected in the study by Corso et al., not yet reported until now, yield a different ordering of preferences compared to the WTP results. In the original survey, we also measured preferences for prevention and treatment using a discrete choice paradigm similar to Johannesson et al. and Ubel et al., whereby the full sample of respondents (regardless of which WTP question they were randomized) was asked to choose between an equally effective and costly hypothetical

Table 1. Median Willingness to Pay (WTP) for Treatment or Prevention in Separate Samples, Stratified by Discrete Choice of Program A (Prevention) or Program B (Treatment) in the Full Sample

WTP Treatment WTP Prevention	Choice of Program A (Prevention) \$242 (n=388) \$728 (n=381)	Choice of Program A (Treatment) \$160 (n=118) \$561 (n=134)
WTP Treatment WTP Prevention	Choice of Program A (Prevention) Strong Preferences ^a \$262 (n=252) \$760 (n=233)	Choice of Program B (Treatment) Strong Preferences a \$153 (n=45) \$735 (n=42)

^a Defined by answering that the program was “Extremely” or “Much Better” than the alternative.

prevention and treatment program.⁸⁻⁹ Specifically, all respondents were asked:

Assume that the government has to make a choice between two equally costly programs, A and B, both of which could save the lives of US residents traveling in foreign countries who are at risk of contracting a virus from eating contaminated food. Program A [the prevention scenario] saves the lives of 100 American travelers per year by providing preventative medicine to all persons who are planning to travel to a foreign country. Program B [the treatment scenario] saves the lives of 100 American travelers per year by treating those persons who have already contracted the virus during their travels in a foreign country. Which program do you think is better, Program A or Program B?

How much better is Program A (or B) than Program B (or A)? [Strength of preference.]

Extremely Better, Much Better, Somewhat Better, A Little Better, or No Better.

What is the main reason you preferred Program A (or B) over Program B (or A)? [Open-ended question.]

Our intent in collecting this additional data was to assess whether preferences elicited using one methodology (WTP) differed from preferences elicited using another methodology (discrete choice).

We included strength of preference to mirror the study design presented by Ubel et al.⁹ The inclusion of the open-ended question was designed to qualitatively explore possible explanations for why respondents tended to favor one type of program over another, beyond perceived costs and benefits. In other words, following Subramanian and Cropper's lead, what other benefits from a prevention (or treatment) program did respondents approve of that predicted their program choice?¹⁰

The full sample consisted of over 1,100 respondents who were on average forty-three years old, white (80%), married (56%), without children (61%), with 14.4 years of education, and with a mean household income of \$46,000.¹¹ Overall, the majority of respondents in the full sample chose Program A (73.8%, n=807), the prevention scenario, over Program B (24.0%, n=263), the treatment scenario. This preference ordering did not vary significantly for either group randomized to the hypothetical WTP for prevention scenario or the hypothetical WTP for treatment scenario summarized in the original study. That is, regardless of whether a respondent was asked about their WTP for prevention or their WTP for treatment, a majority always chose Program A (prevention) over Program B (treatment) in the discrete choice scenario described above.

However, we did find that the choice of Program A or Program B significantly affected the dollar amount a respondent was willing to pay for the hypothetical prevention or treatment scenario, but not in a consistent manner (Table 1). As expected, we found that for respondents choosing Program A (prevention) in the discrete choice, their WTP for prevention

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(\$242) was significantly higher than the amount that respondents choosing Program B (treatment) were willing to pay for prevention (\$160). However, for respondents choosing Program B (treatment) in the discrete choice, their WTP for treatment (\$561) was not significantly higher than the amount that respondents choosing Program A (prevention) were willing to pay for treatment (\$728). Even when only including respondents with strong preferences for one of the programs (defined by answering that the program was considered “extremely” or “much better” than the alternative), the WTP responses displayed this same inconsistency (Table 1). However, the overall significance of program selection in the discrete choice experiment on WTP was removed altogether once strength of preference was included in the model (data not shown). These findings support the study results presented by Ubel et al., such that preferences for prevention or treatment, as measured by discrete choice, are basically equalized once strength of preference is incorporated in the model.⁹

Finally, an exploratory qualitative analysis of the open-ended question immediately following the discrete choice question

provides some interesting insight into the “other benefits” motivating discrete choice preferences for prevention over treatment or vice versa. First, two independent reviewers developed categories of responses that naturally emerged from the data. Once the categories were developed, reviewed and agreed upon by the reviewers, (n=14 categories each for the group preferring prevention over treatment and the group preferring treatment over prevention), the reviewers independently coded each response. Cohen’s Kappa for measuring inter-rater reliability between the 2 reviewers was 0.76 for coding the responses to prevention preferred to treatment and 0.87 for coding the responses to treatment preferred to prevention. By convention, a Kappa > 0.70 is considered acceptable inter-rater reliability.¹² For responses where there was not agreement between the reviewers (n=160 for the group preferring prevention and n=33 for the group preferring treatment), the responses were reviewed, discussed and then recoded based on group consensus.

Table 2 shows the number and percent of stated preferences for prevention (or vice versa), based on the fourteen predetermined categories of responses. For

Table 2. Number and Percentage of Responses, by Stated Reason for Preference

Stated Reason for Preference	Prevention Preferred	Treatment Preferred
Proactive vs Reactive: “I prefer it because it is preventive rather than reactive.”	144 (17.9%)	NA
Timing: “If you could prevent before you go, it is better.”	150 (18.6%)	NA
Social welfare/Equity: “Because it would treat everybody, whether they have the disease or not.”	25 (3.1%)	NA
Better “quality of life”: “Preventive measures can improve a lot of things, such as quality of life.”	4 (0.5%)	NA

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those preferring prevention, a plurality of responses (>35%) stated that the timing or the proactive nature of prevention was the primary reason influencing their choice.

This bias for action is general and wide-spread, according to Patt and Zeckhauser, and can help explain both individual and societal decisions that may on the surface

Worry/Regret avoidance: "No worries while traveling if you've already taken preventive measures."	20 (2.5%)	NA
"An ounce of prevention is worth a pound of cure."	9 (1.1%)	NA
Treatment/medicine avoidance: "Because you may not be able to tolerate the meds they give you for treatment."	42 (5.2%)	21 (7.5%)
"Why treat something I don't have?" Sickness/serious illness avoidance: "Less misery involved. No one is ill. Prevents illness in the first place."	99 (12.3%)	5 (1.8%)
"I'd rather have the treatment because if I don't I'd probably die." Knowledge/Community awareness/education: "Because preventive measures raise an individual's or community's	15 (1.9%)	1 (0.4%)
base knowledge about the general health situation, treatment does not." Preference driven by scenario – foreign aspect: "I prefer prevention and the fact that it is handled in the States."	12 (1.5%)	5 (1.8%)
No specific reason: "It's just better."	162 (20.1%)	58 (20.8%)
Less costly: "I feel that there would be less cost." "Because the costs are so much less with treating	66 (8.2%)	46 (16.5%)
those who are infected" More effective: "There is less risk."	45 (5.6%)	13 (4.7%)
"It would be more cost effective"	13 (1.6%)	16 (5.7%)
Society wouldn't comply with prevention: "I do not think American society is geared towards preventive medicine and not many people would go that way."	NA (3.2%)	9
More confident/comfortable with choice: "It covers a bit more. I feel comfortable with (treatment)."	NA (1.4%)	4
Prefer targeted medicine/Fewer people need medicine: "It targets people that already have the problem."	NA (22.2%)	62
Improves surveillance of disease: "(With treatment) you can measure the disease; otherwise you can't."	NA (1.4%)	4
Personal responsibility without government interference: "Less government intervention. People should pay their own way and save money of taxpayers."	NA (4.7%)	13
Risks are too small to consider prevention: "I think the possibility of acquiring the disease is slight if you are careful."	NA (7.9%)	22

NA = Not applicable for this sample

appear irrational.¹³ Additionally, approximately 15% stated that prevention was less costly, more effective and/or more “cost-effective” than treatment, despite the hypothetical nature of the question that was designed to equalize costs and benefits. A substantial percentage (12%) of respondents also stated a desire to avoid any sickness, suffering, or illness. Fewer (5%) stated their desire to avoid treatments and any complications that might arise and to avoid worry/regret (3%). The avoidance of uncertainty, worry or regret has been explained before by Redelmeier et al.; the authors state that individuals have some sense of their susceptibility to worry and may avoid situations that would give rise to this emotion.¹⁴ This effect of worry may explain individuals’ compliance with preventive measures that are not always proportional to the intervention’s expected benefits.

For those preferring treatment, 27% cited costs, effectiveness or “cost-effectiveness” as the main reason influencing their choice. Other factors influencing preferences for treatment included the desire for a more targeted intervention, as in treating the few as opposed to treating the masses (21%), and the fact that risks were too small to consider prevention beforehand (8%).


Conclusions

Whether we consider one’s personal decision to spend resources on preventive screening services rather than for therapeutic care or a government’s decision to spend resources on treatment-oriented research versus community-based preven-

tion interventions, no easy way to resolve this competition for resources exists at any level of decision making. In deciding how to prioritize and allocate scarce resources towards competing prevention and treatment health care programs, we must consider factors like the effectiveness of alternative interventions, the magnitude of a program’s benefits and costs and societal preferences.

As this paper has illustrated, individual preferences for prevention versus treatment can differ by the methodology used to elicit preferences. In turn, preferences can be motivated by conditions that are not explicitly related to the costs or benefits of an intervention. As such, head-to-head evaluation or economic evaluation of prevention and treatment interventions to inform allocation decisions might not reveal true societal preferences. Additionally, as others have noted, when strength of preference is incorporated, perhaps the disparity between preferences for prevention and treatment options is less remarkable anyway.⁸⁻⁹

Do we, as a society, need to reconcile these differences in order to make effective health policy? Perhaps these differences are justified because what individuals want for themselves differs from what they want for society.¹⁵ According to a past Harris Poll of American citizens, twice as many respondents favored spending a higher proportion of all health care dollars on prevention compared to treatment (46% and 23%, respectively).¹⁶ Yet, personal health care expenditures on treatment continue to consistently outweigh personal expenditures on prevention. We may well have different priorities as individual consumers of health care from those we have as

citizens interested in health policy.¹⁷ Although rational decision making should be concerned with the relationship between macro-level decisions made by government (i.e. laws banning smoking in public places) and micro-level decisions made by individuals (i.e. exercising twenty minutes daily to prevent heart disease), this does not suggest that we will be able to reconcile these differences. Since treatment and particularly prevention preferences may have attributes that are not easily captured with any preference elicitation techniques, perhaps using only one method to make policy decisions is inadequate. 

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References

1. Guyer B, Freedman MA, Strobino DM, and Sondik E. Annual summary of vital statistics: Trends in the health of Americans during the 20th century. *Pediatrics* 2000;106(6):1307-1318.
2. Fleck LM. Just health care rationing: a democratic decisionmaking approach. *University of Pennsylvania Law Review* 1992;140:1597-1636.
3. Calabresi G and Bobbitt P. *Tragic Choices*. New York, NY: W.W. Norton, 1978.
4. Messonnier M and Meltzer M. Chapter 8: Cost-benefit analysis. In Haddix A, Teutsch S, and Corso P (eds). *Prevention Effectiveness: A Guide to Decision Analysis and Economic Evaluation*. New York: Oxford University press, 2003.
5. Phillips KA and Holtgrave DR. Using cost-effectiveness/cost-benefit analysis to allocate health resources: a level playing field for prevention? *American Journal of Preventive Medicine* 1997;13:18-25.
6. Cretin S. Cost/benefit analysis of treatment and prevention of myocardial infarction. *Health Services Research* 1977;174-189.
7. Sen A. The possibility of social choice. *The American Economic Review* 1999;89(3):349-378.
8. Johannesson M and Johannsson P-O. A note on prevention versus cure. *Medical Care* 1997;41:181-7.
9. Ubel PA, Spranca MD, Dekay ML, Hershey JC, and Asch DA. Public preferences for prevention versus cure: what if an ounce of prevention is worth only an ounce of cure? *Medical Decision Making* 1998;18:141-148.
10. Subramanian U and Cropper M. Public choices between life saving programs: the tradeoff between qualitative factors and lives saved. *Journal of Risk and Uncertainty* 2000;21:117-49.
11. Corso PS, Hammitt JK, Graham JD, Dicker RC, and Goldie SM. Assessing preferences for prevention versus treatment using willingness to pay. *Medical Decision Making* 2002;22(5):S92-S100.
12. Landis JR and Koch GG. The measurement of observer agreement for categorical data. *Biometrics* 1977;33:159-174.
13. Patt A and Zeckhauser R. A penchant for actions in environmental decisions. Presented at the Society for Risk Analysis annual meeting in Atlanta, Georgia, December 1999.
14. Redelmeier DA, Rozin P and Kahneman D. Understanding patients' decisions: cognitive and emotional perspectives. *JAMA* 1993;270:72-76.
15. Cairns J. The costs of prevention. *BMJ* 1995;311:1520.
16. Americans support public health spending. Results from the 1999 Harris Poll. *The Nation's Health: American Public Health Association*, January 2000.
17. Klein R. Rationing in action: dimensions of rationing: who should do what? *BMJ* 1993;307:309-311.