Don’t Throw Your Heart Away: Layperson Study 1
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Study Information

Title

Heart Transplant Tradeoff Study: 5-Condition Layperson Study

Authors

Description

Publicly available outcome assessments for transplant programs do not make salient that some programs tend to reject many of the hearts they are offered, whereas other programs accept a broader range of donor offers. We use empirical studies to test whether transplant center performance data (i.e. transplant and waitlist outcome statistics) that reflect center donor acceptance rates influence laypersons to evaluate centers with high organ decline rates less favorably than centers with low organ decline rates. 1000 lay participants will be recruited from Amazon Mechanical Turk and randomized to one of five different information presentation conditions. Participants will be given an introduction to the donor organ match process, then asked to view the table of transplant outcomes corresponding to the condition they were randomized to. Each participant is asked to choose between two hospitals: one hospital with an non-selective, "accepting" strategy (takes all donor heart offers), and one hospital with a more selective, "cherrypicking" strategy (tends to reject donor offers that are less than “excellent” quality). In order to identify the decision process that underlies this choice pattern, we will examine a putative mediator. Specifically, participants will be asked to rate the extent to which they considered patients' chances of getting an excellent heart, avoiding a less-than-optimal heart, and getting any type of heart when making their choice between the two hospitals.

Hypotheses

Hypothesis 1: When centers must present information on their transplant success rate only, lay evaluators will respond by selecting hospitals with higher transplant success. However, if information presented on transplant outcomes is stratified by the number and quality of donors used, or displayed in addition to total survival rates, then participants will respond by selecting hospitals with higher organ acceptance rates rather than the hospital with higher transplant outcomes. Hypothesis 1a: Preference for the non-selective transplant center will be lower (than for the selective center) in condition 1 (baseline: combined transplant survival only), compared to the other 4 conditions. That is, a higher proportion of participants will prefer the non-selective center over the selective center in conditions 2, 3, 4, and 5, relative to condition 1. Hypothesis 1b: There will be a main effect of viewing total survival, such that in conditions 2 and 4 (when total survival is displayed), participants will prefer the non-selective center over the selective center, relative to the baseline condition 1. Hypothesis 1c: There will be an additional main effect of viewing stratified transplant survival, such that in conditions 3 and 4 (when transplant survival is stratified by number and quality of donor hearts accepted at each center) participants will prefer the non-selective center over the selective center, relative to the baseline condition 1. Hypothesis 1d: There will be an interaction effect between total and stratified transplant survival, such that when participants view both stratified transplant survival and total survival outcomes together, preference for the non-selective center is higher relative to preferences at baseline (condition 1), but not higher relative to preferences when total survival information is added to the display (condition 2) or stratified transplant survival

only is displayed (condition 3). Hypothesis 2: There will be an indirect (mediated) effect of providing participants with information about stratified transplant survival or total survival; this information will lead to higher preference for the non-selective hospital by leading participants to think that the chances a patient at either hospital will "get a heart at all" is a more important factor in their decision (about which hospital is a better choice for patients). Specifically ratings of importance (0-100 continuous scale) for the item "likelihood of getting any heart" will differ across conditions 1-4 such that "getting any heart" will be rated lower in condition 1 than in the other three conditions. Furthermore, ratings on this item will be associated with choice, such that higher ratings will be associated with choice of the non-selective center. Hypothesis 3: Participants who view total survival only (condition 5) will show a higher preference for the non-selective center relative to participants in the baseline combined transplant survival display (condition 1) such that the effect of displayed total survival alone will be similar to the effect of displaying both stratified transplant survival and total survival outcomes together (as in condition 4).

Design Plan

Study type

Experiment - A researcher randomly assigns treatments to study subjects, this includes field or lab experiments. This is also known as an intervention experiment and includes randomized controlled trials.

Blinding

- For studies that involve human subjects, they will not know the treatment group to which they have been assigned.

Is there any additional blinding in this study?

n/a

Study design

We have a between-subjects design in which participants are randomized to one of five information conditions. In each condition, they make a choice between two hospitals (one with a non-selective donor acceptance strategy, and another with a more selective donor acceptance strategy). The first four conditions (1-4) will be included in our main analysis, which is a 2x2 design with 2 factors (total survival and transplant survival) and 2 levels per factor: (i) Total survival: "total not displayed" = reference level, in which only transplant survival rate (and not total or waitlist survival) is shown "total displayed" = transplant survival is displayed along with the overall survival rate at each center, which is computed from survival rates of both transplant and waitlist patients (ii) Transplant survival: "combined": reference level, in which transplant survival rate is not stratified by number and quality of donor hearts accepted at each center "stratified": transplant survival rate stratified into patients who received excellent donor organs and patients who received less than optimal donor organs The additional fifth condition, in which only total survival outcomes (and no transplant survival outcomes) are displayed, will be included in the study and analyzed separately.

Randomization

We will use simple randomization, where each participant will be randomly assigned to one of the five predetermined conditions. The Qualtrics randomizer function will be used for randomization into a condition.

Sampling Plan

Existing Data

Registration prior to creation of data
Explanation of existing data

n/a
Data collection procedures

Recruitment: 1000 lay participants will be recruited from Amazon Mechanical Turk, an online crowdsourcing platform used for testing human intelligence tasks and research paradigms. Participants will be recruited via a "HIT" post titled "Healthcare Study (~10 minutes)" described as "choosing between heart transplant hospitals based on outcome data (Potential $0.20 bonus)." They will be recruited for the HIT upon meeting two criteria. (1) 99% HIT approval rate or higher (2)1000 or more HITS approved Inclusion criteria: Participants who are already qualified mTurk workers with Worker Accounts meeting the above criteria will be asked to participate if they confirm the following inclusion criteria in the consent form. (1) 18 years of age or older (2) must read and understand the information in the consent form (3) must want to participate in the research and continue with the survey (4) must live in United States Payment: Participants will be paid $1.33 for completing the survey (raised to $1.43 if one bonus question is answered correctly and $1.53 if two bonus questions are answered correctly). Exclusion criteria: (1) Participants on mTurk will not be allowed to participate if they fail to pass the initial "bot screening", a multiple-choice question that asks, "What phone number should you dial when there is an emergency?" The obvious correct response in this screening question is "911", so participants who select one of the incorrect responses (i.e. "1-800-ANTIBOT", "1-877-MTURKER", "123") are filtered out and not allowed to complete the survey. (2) Participants on mTurk will be allowed to participate, but excluded from data analysis, if they submit a nonsense response to the free-response question which reads, "In your own words, why do you think patients should choose the hospital you picked?" This question takes place after the participant has viewed the choice stimuli and selected their response. If participants input nonsense in the text response box, they will be permitted to complete the survey and paid, but filtered out from the data analysis

Sample size

Our target sample size is 1000 participants. We expect that this will amount to approximately 200 participants per condition, although due to the nature of the randomization technique used (Qualtrics randomizer function), we may end up with slightly more or slightly less than 200 per condition.
Sample size rationale

Sample sizes were calculated to yield at least 90% power to detect a 15 percentage point difference (e.g., 45% vs. 60%) between baseline condition 1 and the other 4 conditions, with α=0.05 (GPower 3.1.9.4).

Stopping rule

Participants will be recruited until a sample size of 1000 is achieved.

Variables

Manipulated variables

We will manipulate how transplant center outcomes are presented. Different components of the same outcome statistics for two transplant centers will be varied over five different conditions. (1) Condition 1 ("baseline" condition): view only combined transplant survival (e.g. transplant survival rate not stratified by number and quality of donor hearts accepted at each center) (2) Condition 2: view combined transplant survival + total survival (e.g. overall survival rate at each center, computed from survival rates of both transplant and waitlist patients) (3) Condition 3: view only stratified transplant survival (e.g. transplant survival rate stratified into patients who received excellent donor organs and patients who received less than optimal donor organs) (4) Condition 4: view stratified transplant survival + total survival (5) Condition 5: view only total survival The first four conditions (1-4) will be included in our main analysis, which is a 2x2 design with 2 factors (total survival and transplant survival) and 2 levels per factor: (i) Total survival: "total not displayed" = reference level, in which only transplant survival rate (and no total or waitlist survival) is shown "total displayed" = transplant survival is displayed along with the overall survival rate at each center, which is computed from survival rates of both transplant and waitlist patients (ii) Transplant survival: "combined": reference level, in which transplant survival rate is not stratified by number and quality of donor hearts accepted at each center "stratified": transplant survival rate stratified into patients who received excellent donor organs and patients who received less than optimal donor organs The additional fifth condition, in which only total survival outcomes (and no transplant survival outcomes) are displayed, will be included in the study and analyzed separately.

Measured variables

The outcome variable will be a binary choice between two hospitals: one with a selective donor-heart acceptance strategy and one with a non-selective donor heart acceptance strategy. Participants will respond to the question "Which Hospital is a better choice for patients? Please click on one of the two tables below to indicate which hospital is the better choice." Participants will choose been two outcome tables featuring the selective and non-selective hospital (counterbalanced, such that each of the two choices is equally likely to be presented at top of the choice scenario in each condition). The number of participants that choose each hospital will be the measured outcome variable used in analyses. On the next page of the survey, participants will respond to three mediator questions: "There are many reasons why one transplant hospital might outperform another. Which reasons were most important in your decision? Please move the slider to indicate how much you considered each of the reasons below (0=reason was not important, 100=reason was extremely important)." Participants will then move a slider bar (0-100) to indicate the importance of the following three items: (1)

Patients were more likely to receive an excellent donor heart at the hospital I picked. (2) Patients were less likely to receive a marginal donor heart at the hospital I picked. (3) Patients were more likely to receive any kind of heart at the hospital I picked. The third item (more likely to receive any kind of heart) will be the only variable that is included in the planned mediation analysis.

Indices

No response

No files selected

Analysis Plan

Statistical models

To test Hypotheses 1a /1b/1c/1d, we will use a binomial logistic regression analysis. The two categorical independent variables will be 'total survival displayed' and 'stratified transplant survival'; the model will also include an interaction term of these two variables. The dependent variable is binary choice of hospital. -We will test whether the main effect of "total survival displayed" is statistically significant and in the predicted positive direction. -We will test whether the main effect of "stratified transplant survival" is statistically significant and in the predicted positive direction. -We will test whether the interaction effect "total*stratified" is statistically significant in the predicted negative direction. To test Hypothesis 2, we will conduct a causal mediation analysis to determine whether information display had a mechanistic effect on hospital choice through our proposed mediator. We will estimate the average causal mediation effect (ACME), average direct effect (ADE), and the total effect. The ACME is the effect of each information display condition (total, stratified, or total*stratified) on the outcome of hospital choice (selective vs. non-selective), mediated through the hypothesized mediator (the importance of "getting any heart" at each hospital when considering the choice). The remaining effect of information display on hospital choice that is not mediated through the hypothesized mediator represents the ADE. The entire effect of the information display on hospital choice via the hypothesized mediator and the direct effect is the total effect. The proportion of the total effect that is accounted for by the ACME is called the proportion mediated.{Imai, 2010}. Analyses will be performed using the “mediation” package in R (The R Foundation for Statistical Computing).{Tingley, 2014}. We will generate 95% confidence intervals by using 1000 bootstrap simulations. The unstandardized point estimate of the ACME and its 95% confidence intervals will be interpreted. -A significant ACME for "total survival displayed" would suggest that displaying total survival works via increasing the perceived importance of "getting any heart" to increase preference for the non-selective hospital. If the ACME is non-significant, we will identify where the causal path breaks down. -A significant ACME for "stratified transplant survival" would suggest that stratifying transplant survival by number and quality of accepted donors works via increasing the perceived importance of "getting any heart" to increase preference for the non-selective hospital. If the ACME is non-significant, we will identify where the causal path breaks down. -A significant ACME for "total survival displayed*stratified transplant survival" would suggest that the combination of displaying total survival and stratifying transplant survival by number and quality of accepted donors works via increasing the perceived

importance of "getting any heart" to increase preference for the non-selective hospital. If the ACME is non-significant, we will identify where the causal path breaks down. To test Hypothesis 3, we will use a binomial logistic regression analysis with a contrast test for a difference in effect size between conditions 4 and 5.

No files selected

Transformations

Logistic regression analysis: The categorical predictor "total survival displayed" will be dummy coded (0=not displayed, 1=displayed), with 'not displayed' as the reference category. The categorical predictor "transplant survival stratified" will be dummy coded (0=not stratified, 1=stratified), with 'stratified' as the reference category. The outcome variable "choice of hospital" will be dummy-coded (0=selective hospital, 1=non-selective hospital). The reference category is 'selective hospital'. Mediation analysis: The categorical predictor "total survival displayed" will be dummy coded (0=not displayed, 1=displayed), with 'not displayed' as the reference category. The categorical predictor "transplant survival stratified" will be dummy coded (0=not stratified, 1=stratified), with 'stratified' as the reference category. The categorical interaction term "total survival displayed*transplant survival stratified" will be dummy coded (0=total and stratified information not displayed together, 1=both total and stratified information displayed together), with 'both' as the reference category. The continuous mediator variable "get any heart" will be mean-centered for each analysis. The outcome variable "choice of hospital" will be dummy-coded (0=selective hospital, 1=non-selective hospital). The reference category is 'selective hospital'.

Inference criteria

We will use the standard p=0.05 criteria for determining if the results are significantly different from those expected if the null hypothesis were correct.

Data exclusion

(1) Participants on mTurk will not be allowed to participate if they fail to pass the initial "bot screening", a multiple-choice question that asks, "What phone number should you dial when there is an emergency?" The obvious correct response in this screening question is "911", so participants who select one of the incorrect responses (i.e. "1-800-ANTIBOT", "1-877-MTURKER", "123") are filtered out and not allowed to complete the survey. (2) Participants on mTurk will be allowed to participate, but excluded from data analysis, if they submit a nonsense response to the free-response question which reads, "In your own words, why do you think patients should choose the hospital you picked?" This question takes place after the participant has viewed the choice stimuli and selected their response. If participants input nonsense in the text response box, they will be permitted to complete the survey and paid, but filtered out from the data analysis. In addition, two attention checks will be used. The data will be analyzed with all participants, and with only the participants who pass both of these attention checks.

Missing data

If a participant does not complete the entire survey, they will not be included in the analysis.

Exploratory analysis

No response

Other

Other

No response