finding

Ventilator allocations: The effect of mere identifiability

Ilana Ritov & Stephen M. Garcia

abstract

The COVID-19 crisis has raised a dire dilemma among medical professionals. Faced with a shortage of critical equipment and supplies, how do hospital administrators and physicians determine whether to divert resources from one patient to another? Most decision-makers will prioritize saving younger patients over older ones, because older patients generally have a much shorter life expectancy. But emotions, such as those elicited when a patient's name is known and the patient is thereby humanized, can interfere with rational decision-making. At the height of the pandemic, we conducted three studies in which participants were asked to imagine being hospital officials tasked with allocating ventilators under two conditions: when the affected patients were and were not identified by name. Participants were less likely to reassign a ventilator from an older patient to a younger one when the patients had been named than when they had not. These results suggest that decision-makers are more likely to make the efficient choice—the one that should save more years of life—when the individuals affected by the choice remain anonymous. When patients are humanized by being named, less rational and more emotional considerations appear to govern how people choose to distribute lifesaving equipment. Our findings imply that keeping patients anonymous may help facilitate the efficient allocation of scarce medical resources.

Ritov, I., & Garcia, S. M. (2022). Ventilator allocations: The effect of mere identifiability. *Behavioral Science & Policy, 8*(1), 35–44.

Core Findings

What is the issue?
People often do not act optimally when allocating scarce medical resources, especially in times of crisis. When patients' names are known by decision-makers, this can present a barrier to efficiency, potentially costing more lives and/or life years. Humanizing patients, therefore, can sometimes have a collectively detrimental effect on health care outcomes.

How can you act?
Selected recommendations include:
1) Establishing priorities for allocating resources
2) Requiring uninvolved third parties, not people on the front lines, to allocate scarce resources
3) Asking patients directly how they feel about reallocating resources away from them

Who should take the lead?
Health care leaders and policymakers

The COVID-19 pandemic has created a shortage of medical equipment unlike any that the United States has experienced in this century. The limited supply of ventilators and other advanced medical resources creates major roadblocks to providing optimal care for severely ill COVID-19 patients.[1] As a result, professionals in many health care settings have been forced to ration potentially life-saving equipment and have not always done so in a rational manner. In response to this situation, the medical community has sounded the alarm that "hospitals and states urgently need to establish and implement policies that more fairly allocate these scarce resources."[2]

But what does "fairness" look like? If, for instance, the supply of ventilators is limited, who is going to receive one? Under a wide range of circumstances, most people will prioritize the health of younger people over older ones.[3] This choice, as Geoffrey Goodwin and Justin Landy have put it,

> is usually thought to be based on a *years left* argument—all else equal, younger individuals have a greater number of valuable life years ahead and so ought to be prioritized in order to maximize future outcomes . . . and, separately, a *years lived,* or *fair innings,* argument—younger individuals have not had as much time to live and should be prioritized on the grounds of fairness.[3]

Yet there are some barriers to maximizing the rational distribution of these resources, or making the "efficient" choice. One of these barriers arises when decision-makers know the names of the patients in question, which tends to humanize them. In this article, we explore how merely identifying a patient who is on a ventilator or who does not have a ventilator but needs one influences the likelihood that a decision-maker will assign the ventilator to the more "deserving" patient. We show that the identifiability of patients weakens the impact of efficiency, or utilitarian, considerations in ventilator assignment and makes allocation decisions more difficult.

Theoretical Background

Identifying individuals makes them more vivid.[4] Vividness is important because decisions that affect people who seem real are likely to engage people's emotions, whereas decisions about people in the abstract are more likely to be processed in a rational, deliberative mode. The behavioral science literature has shown that merely identifying a target of a decision has the power to change decision-makers' actions in many domains. For example, people are more likely to donate to a cause if one particular beneficiary has been identified than if a group of needy individuals has been presented.[5–8]

Further, people in general do not like to cause harm, and they particularly do not like to cause harm when those who will be hurt are viewed as individual people rather than as abstract entities. This reluctance to do damage in the face of mere identification has already been demonstrated in other settings. For example, researchers have found that people's support for affirmative action declined more when an individual who would be affected negatively by affirmative action could be pinpointed than when the person was not identified.[9] Similarly, in the justice system, researchers have determined that people were more lenient in their recommendation for punishment when perpetrators were identified than when they were not.[10]

In the case of allocating resources such as ventilators, harm is a real possibility. It is likely that the people making the decision believe (correctly) that the individual removed from the ventilator has a high probability of dying as a result. In this article, we propose that because people are reluctant to harm a specific individual, decision-makers will be more averse to reassigning a ventilator after the patient on the ventilator has been identified by name than when the patient has not been identified.

We further argue that the degree of reluctance to cause harm can differ depending on whether the harm results from action or inaction. Deviating from the current situation—from the status quo—is perceived as an action, whereas accepting the status quo is considered an omission. Our earlier research demonstrates

that people regret a bad outcome of a decision more if the harm was caused by an action than if it resulted from inaction.[11–13] For hospital workers, moving a ventilator from an older patient to a younger one would be perceived as active harm, because it involves making a change from the existing situation. Not giving the ventilator to the younger candidate, which can be considered the default condition, would be experienced as harm through omission. Thus, when a decision-maker would actively cause harm by moving the ventilator from the older patient to the younger one, knowing the names of the patients would be expected to particularly heighten discomfort over the action and increase the likelihood of deciding that the person already on the ventilator will stay on the ventilator.[13]

Decision-makers may sometimes face a choice between two patients needing a single ventilator when neither person is yet attached to the machine—a situation we describe as having no status quo. In this case, one might expect decision-makers to have no worries about actively causing harm and thus to prefer the efficient option of giving the ventilator to the younger patient. Still, identifying the potential recipients of the ventilator may influence the decision even in this situation. When the patients are identified, emotional reactions—particularly the negative feelings associated with harming by omission the patient who will not receive the ventilator—could pull decision-makers away from efficiency and decrease their preference for the life-maximizing option of giving the ventilator to the younger person.

Method Overview

We tested the effects of mere identification on ventilator allocation by assigning 1,074 participants to three separate studies. The participants were recruited from Amazon Mechanical Turk and paid to participate in this research.

In all three studies, we asked participants to imagine that they were hospital administrators faced with dilemmas that are now occurring around the world because of COVID-19. In Studies 1 and 2, participants were told that their hospital's intensive care unit (ICU) is completely full, and a new patient has come in with severe respiratory failure. The new patient is a 35-year-old man. He can survive only if he is connected to a ventilator. To provide the ventilator, hospital staffers must disconnect another patient from the potentially lifesaving machine. The other patient, an 83-year-old man, is also experiencing severe respiratory failure. In Studies 1 and 2, the status quo is that the ventilator is currently in use by the older man but could be reassigned to the newly arrived younger man. Study 3 differs from Studies 1 and 2 in that for half of the participants, there is no status quo—the older and younger patients enter the ICU at the same time, and both need a ventilator. Thus, for half of the participants pretending to be hospital administrators in Study 3, making a decision as to which person gets the equipment is not affected by the potential harm of actively taking it away from a gravely ill person.

In all of the studies, we randomly assigned participants to either the *identified* or the *unidentified* condition. In the identified condition, the younger and older patients were named either "Joshua Frey" or "Jack Evers," with the names counterbalanced across conditions (half of the time the younger patient was Joshua, half of the time he was Jack). In the unidentified condition, no names were mentioned.

Study 1

Method

Study 1 focused on whether identifying patients by name would affect the likelihood that an administrator would make the theoretically efficient decision to reassign a ventilator from an older patient to a younger patient in need of the device. We asked 255 participants (87 women, 168 men) to imagine that they were hospital administrators deciding how to allocate a single ventilator in an ICU. The participants read the following explanatory text:

"Identifying individuals makes them more vivid"

> The ICU in the hospital is completely full, and a new patient comes in with severe respiratory failure. The new patient is 35 years old. The only possibility to treat him is to connect him to a ventilator. To do that you must disconnect from the ventilator another patient, age 83, who also suffers from severe respiratory failure.

Participants were asked to respond yes or no to the question of whether they would disconnect the older patient from the ventilator and give it to the new patient. We predicted that fewer people would reassign the ventilator to the younger patient when the older and younger patients were identified by name than when they were not identified.

Results

Consistent with our hypothesis, the statistical analysis showed that a smaller proportion of the participants said they would disconnect the older patient from the ventilator to help the younger patient when the patients were identified (42.6%) than when they were not identified (55.6%; $\chi^2 = 4.313$, $p = .038$). That is, not identifying the patients led to the more efficient, or rational, choice. (See Figure 1. Print readers: Color versions of the figures are available online.) For a discussion of the statistical terms used in this article, see note A.

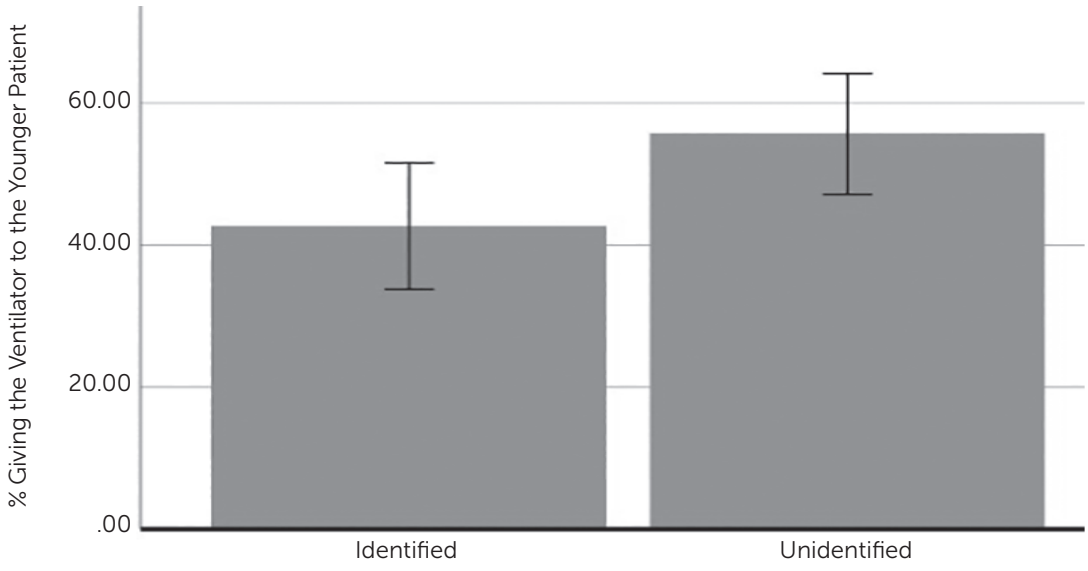
Study 2

Method

In Study 2, we addressed the same question as in Study 1 but also evaluated whether considering hypothetical future patients would produce results that differed from those produced when participants considered unidentified patients in the present. This study involved 350 participants (137 women, 211 men, two unspecified) and three conditions: the two conditions from Study 1 (identified versus unidentified), plus a new one relating to the future.

We randomly assigned participants to the identified, unidentified, and future conditions. In the identified and unidentified conditions, we presented the same scenario we used in Study 1. In the *future* condition, participants read a description of a hypothetical future situation in which an administrator would have to consider reassigning a ventilator from an older patient to

Figure 1. Percentage of participants choosing to disconnect the older patient & give the ventilator to the younger patient (Study 1)



Note. In the identified condition, participants were told the patients' names, whereas in the unidentified condition, patient names were not provided. Error bars reflect 95% confidence intervals.

a younger patient who needed one. This hypothetical situation did not identify the patients by name. Thus, the participants were considering situations relating to unknown people. In that sense, our future condition was similar to the unidentified one.

"participants were considering situations relating to unknown people"

Participants in all conditions were asked whether they would disconnect the older patient from the ventilator and give it to the new patient. In Study 2, we changed the way we measured the intention to disconnect, now using a seven-point scale ranging from 1 (*definitely no*) to 7 (*definitely yes*). We predicted that because of reluctance to cause harm to named individuals, the participants would be less likely to give the ventilator to the younger patient in the identified condition than in the unidentified and future conditions.

Results

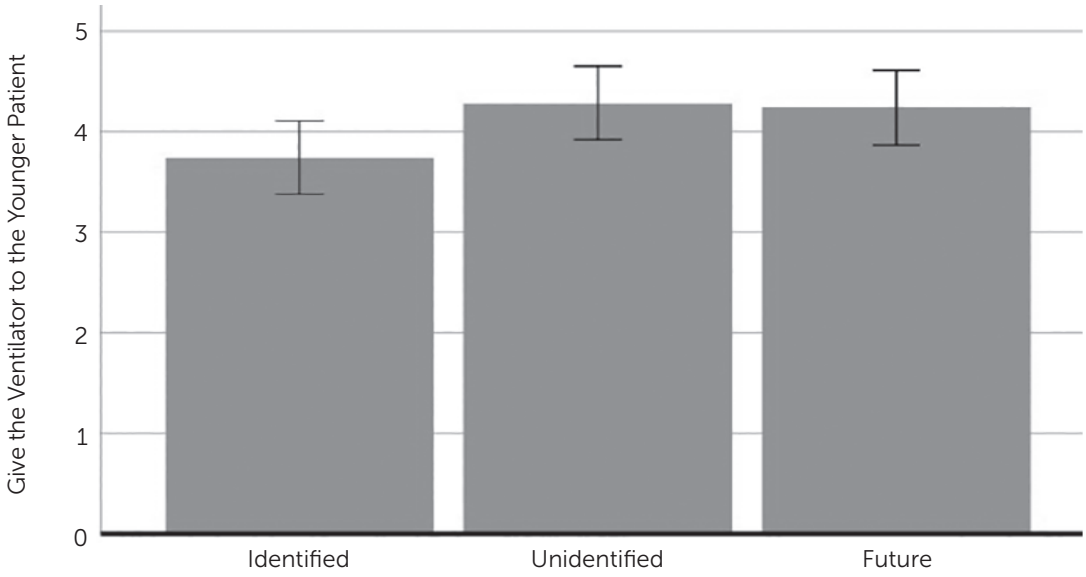
We found a significant difference between the mean ratings of intention to disconnect in the identified and the unidentified conditions (M = 3.74 versus M = 4.28, p = .039), essentially replicating the effect found in Study 1. The higher the means, the more inclined the participants in the role of administrators were to favor the younger life. (See Figure 2.) We also observed a difference between the identified and future conditions that approached significance (M = 3.74 versus M = 4.24, p = .060). As expected, the unidentified and future conditions did not significantly differ (M = 4.28 versus M = 4.24, p = .872). See the Supplemental Material for more details on these analyses.

Study 3

Method

In Study 3, we examined whether decision-makers would respond differently to patient identification in the absence of the influence of an existing status quo—that is, when the older patient was not already on a ventilator. We asked 469 participants (191 women, 277 men, one unspecified) how they would allocate a

Figure 2. Mean ratings of intention to disconnect the older patient & give the ventilator to the younger one (Study 2)



Note. In the identified condition, participants were told the patients' names, whereas in the unidentified condition, patient names were not provided. In the future condition, participants considered the same scenario as a hypothetical future choice between two unnamed patients. Higher numbers indicate a greater tendency to give the ventilator to the younger patient. Error bars reflect 95% confidence intervals.

scarce resource when there was and was not a status quo. Half of the participants received instructions similar to those in Study 1, where the older person had a ventilator to start with. For the other half, the questionnaire posed this dilemma: "You are a hospital administrator when two patients, one young and one elderly, arrive at the ICU at the same time." In this case, then, the older person is not already on the ventilator and no one had to commit the active harm of detaching someone from a ventilator. In other words, this condition negated the predisposition to maintain the status quo.

The *status quo* condition participants were asked whether they would disconnect the older patient from the ventilator and give it to the younger patient. They rated their responses on a 7-point scale ranging from 1 (*definitely no*) to 7 (*definitely yes*). Participants in the *no status quo* condition were asked to identify which patient—the 35-year-old patient or the 83-year-old patient—they would connect to the ventilator. They rated their responses on a 7-point scale ranging from 1 (*definitely the older patient*) to 7 (*definitely the younger patient*). Half of the participants in the status quo and no status quo conditions had the patients identified by name. Study participants thus fell into four groups: identified, no status quo; unidentified, no status quo; identified, status quo; unidentified, status quo.

We hypothesized that when there was no status quo, participants would be more likely to make the rational choice; that is, to give the ventilator to the younger patient. But we also reasoned that identifying the potential recipients by name would heighten the emotional reaction of the decision-makers, especially by eliciting negative feelings about harming the patient who would not receive the ventilator. This reaction would discourage participants from making the life-maximizing choice to give the equipment to the younger patient, who likely had more years to live. Thus, we predicted that identifying the patients by name would reduce life-maximizing efficiencies in both the presence of the status quo, when the decision-maker is deciding whether to reassign the ventilator, and in the absence of the status quo, when neither participant is on the ventilator.

Utilitarian decision

Rationalist optimization based on net cost-benefit of assumed outcomes

Deontological choice

Following rules that define moral obligations to others

Sacrificial dilemma

A choice between letting several people die and saving those people by sacrificing fewer other people

Results

As in the earlier two studies, our statistical analysis found that participants were less likely to give the ventilator to the younger patient when the two patients were identified by name than when they were unidentified (M = 4.41 versus M = 4.88). This effect of identifiability on resource allocation was statistically significant, $F(1, 465) = 7.494$, $p = .006$, $\eta_p^2 = .016$.

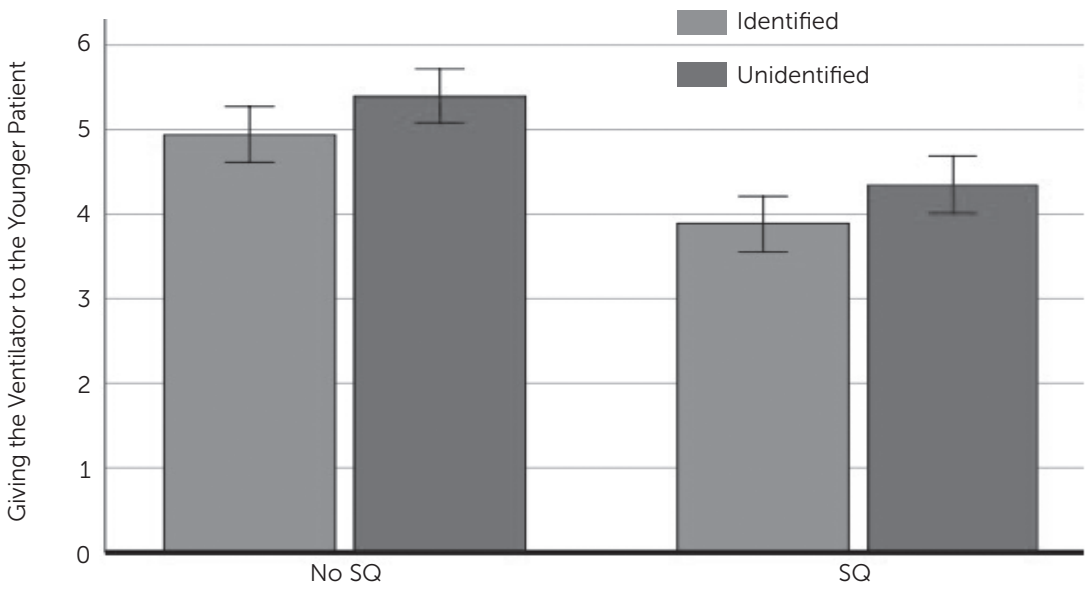
We also found that whether participants encountered a status quo situation or a no status quo situation had a significant effect on their decisions, $F(1, 465) = 39.603$, $p < .001$, $\eta_p^2 = .078$. As predicted, participants tended less toward giving the ventilator to the younger patient in the status quo situation (in which the older patient was already on the ventilator) than when the two patients showed up at the hospital simultaneously (M = 4.11 versus M = 4.64).

Additional analyses implied that identifying patients by name influences decision-making in both the presence and the absence of the status quo. (See Figure 3.) Comparing the identified and unidentified means separately for each status quo condition yielded a significant or nearly significant difference in mean intention to give the younger patient the ventilator under each of the two conditions. In the status quo condition, the mean score for the intention to give the ventilator to the younger patient was lower for the identified condition (3.88) than for the unidentified condition (4.35), $t(230) = 1.805$, $p = .072$. Likewise, in the no status quo condition, the mean was 4.94 for the identified condition but 5.39 for the unidentified condition, $t(235) = 2.098$, $p = .037$. See the Supplemental Material for additional statistics.

Aggregate Analysis of the Three Studies

By combining the results of all three studies in an approach known as a *single-paper meta-analysis,*[14] we estimated the impact of patients' identifiability on intentions. Because Study 1 did not use the 7-point scale applied in

Figure 3. Mean ratings of intention to give the ventilator to the younger patient (Study 3)



Note. SQ = status quo. In the no status quo condition, neither patient is on the ventilator when the decision regarding who gets the ventilator is made; in the status quo condition, the older patient is already on the ventilator. In the identified condition, participants were told the patients' names, whereas in the unidentified condition, patient names were not provided. Higher numbers indicate greater tendency to give the ventilator to the younger patient. Error bars reflect 95% confidence intervals.

the other two studies, we recoded the data in Studies 2 and 3 so that all three data sets would be comparable. Scores above the midpoint in Studies 2 and 3 were coded as an intention to give the ventilator to the younger patient, and scores below the midpoint were coded as an intention to not give the ventilator to the younger patient. (See the Supplemental Material for more details.) The result was .108, 95% CI [.040, .176]. That is, about 10% more of the decision-makers in this life-or-death situation were inclined to believe that the older patient should have the ventilator instead of the younger one when the patients were identified by name than when they were not. The effect is not large, but it nonetheless seems remarkable, especially when potentially aggregated over hundreds, if not thousands, of lives.

General Discussion

The COVID-19 crisis has revealed the dire dilemma of providing medical services when crucial equipment is in short supply. When resources—such as respiratory ventilators—are scarce, hospital administrators may feel that the best decisions are those that maximize the common good, such as by saving the most years of patient lives possible. The research presented in this article shows that one factor that may impede people's ability to make rational life-maximizing allocation decisions is the identifiability of the patients. More specifically, we show that people are less likely to reassign a ventilator from an older patient to a younger one when the patients have been identified by name than when they have not (Studies 1 and 2). We also found that identifying patients by name decreases the frequency of choosing the efficient life-maximizing option even when no patient has a ventilator yet—that is, when no status quo has yet been established (Study 3).

Implications for Theory

The dilemma we present in this article shows the tension between two kinds of reasoning that people can engage in simultaneously. On the one hand, decision-makers may feel that the rational, utilitarian decision—what we have called the efficient option—is optimal. Such decisions are based on assumed outcomes, for instance, on the belief that a younger patient on

"identifying by name the persons affected by one's actions may influence people's decisions"

a ventilator will live longer than an older patient with the same equipment. On the other hand, people may also feel a need to follow rules, such as the Ten Commandments, that define their moral obligations to others (this is called the *deontological choice*). That is, they may feel it is more ethical to keep alive someone who is already on a ventilator than to remove that ventilator to save someone else. Choosing how to allocate lifesaving ventilators amid a scarcity of resources (when making the efficient decision can feel immoral because it will harm someone) can be viewed as a special case of what has come to be termed a *sacrificial dilemma.* The classic and most studied sacrificial dilemma is the *trolley problem,* in which the decision-maker has to choose whether to sacrifice one person to save several others from a runaway trolley.[15–20]

Research on the trolley problem suggests that judgments based on emotional reactions to actions rather than to outcomes account for preferring the inefficient option.[15,16] Although identifiability effects have not been explored in this context, our findings suggest that identifying by name the persons affected by one's actions may influence people's decisions. Future research may examine the effect of identifying the victims on the choices people make when faced with trolley-type moral dilemmas.

Implications for Practitioners

On the basis of our research, we offer the following practical advice for hospital officials who play a role in the distribution of scarce medical equipment such as ventilators.

Establish Priorities for Allocating Resources. For hospital employees to make efficient decisions, some information about the patients in question must be available. For example, age is a legitimate factor to consider: Prioritizing the young over the old is the utilitarian choice. Other factors might include a patient's preexisting health conditions, whether a patient is a frontline health care worker, and whether a patient is a key decision-maker with responsibility for other people. Establishing and disclosing criteria for allocating resources not only helps avert a dilemma but also adds transparency to the whole allocation process, which will benefit everyone involved: the patients, the medical professionals, the administrators, and the public at large.

Rules are often difficult to craft, yet if criteria are not established, information that may be regarded as irrelevant or even prejudicial—such as one's social, economic, or national status—may pollute an otherwise fair process. For example, allocation decisions may no longer maximize life if decision-makers are reluctant to reassign a ventilator or any scarce medical equipment from a wealthy old individual to a poor young individual or from a native old individual to a foreign-born young individual. Although age is arguably a relevant factor in such efficient allocations, decision-makers should always beware any irrelevant information that may violate lifesaving goals. That said, we acknowledge that some utilitarian perspectives, however distant from our own, may argue that variables such as wealth are relevant because they signal that someone is more likely to survive and thus deserving of scarce medical equipment. Conversely, some would argue that justice calls for the ventilators to go to historically underserved populations.

Uninvolved Third Parties, Not People on the Front Lines, Should Allocate Scarce Resources. In cases where protocols have not been established to avert a dilemma, it would be better to have someone other than frontline personnel who are treating the patient make an allocation decision. In this time of COVID-19, medical professionals and staff should learn patients' names, especially when these patients cannot receive family and friends as visitors. However, if

maximizing life is important, it is more likely that personnel who do not know the patients, such as triage officials, or even impartial computer systems will make the efficient decision. It is important that the frontline worker providing information to the decision-maker not convey any bias, especially with respect to information that might evoke empathy.[21–24]

Ask the Patient. Finally, a decision-maker can always ask the patient directly about how the patient feels about giving a ventilator to someone else. Indeed, research suggests that people, despite being self-interested, can sometimes make a utilitarian decision even when that decision jeopardizes their own lives.[19] The international press widely reported the story of 72-year-old Italian priest Don Giuseppe Berardelli, who died after choosing to give his ventilator to a younger patient who was in need. Thus, patients themselves may be willing to make a personal sacrifice, even the ultimate one, to maximize someone else's life.

Even though the supply of ventilators has increased since the start of the pandemic, similar dilemmas around allocating life-saving resources to patients may well transpire again, perhaps during a future pandemic. We hope that our work leads to the creation of protocols that will ease the decision-making process in these difficult situations. In addition, we believe that beyond demonstrating the effect of identifiability on life-and-death decisions in the era of COVID-19, our research contributes more generally to the understanding of identifiability as a barrier to efficient choice.

endnote

A. Editors' note to nonscientists: For any given data set, the statistical test used—such as the chi-square (χ^2) test, the *t* test, or the *F* test—depends on the number of data points and the kinds of variables being considered, such as proportions or means. *F* tests and *t* tests are *parametric:* They make some assumptions about the characteristics of a population, such as that the compared groups have an equal variance on a compared factor. In cases where these assumptions are violated, researchers make some adjustments in their calculations to take into account dissimilar variances across groups. The *p* value of a statistical test is the probability of obtaining a result equal to or more extreme than would be observed merely by chance, assuming there are no true differences between the groups under study (this assumption is referred to as the *null hypothesis*). Researchers traditionally view $p < .05$ as the threshold of statistical significance, with lower values indicating a stronger basis for rejecting the null hypothesis. In addition to the chance question, researchers consider how much effect a variable has on the statistical results, using measures such as η_p^2 (partial eta squared); η_p^2 values of .01, .06, and .14 typically indicate small, medium, and large effect sizes, respectively. Standard deviation is a measure of the amount of variation in a set of values. Approximately two thirds of the observations fall between one standard deviation below the mean and one standard deviation above the mean. A 95% confidence interval (CI) for a given metric indicates that in 95% of random samples from a given population, the measured value will fall within the stated interval.

author affiliation

Ritov: Hebrew University. Garcia: University of California, Davis. Corresponding author's e-mail: ilana.ritov@huji.ac.il.

supplemental material

- https://behavioralpolicy.org/publications/
- Method & Analysis

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