

## Economics

# Markets Can Improve Rationing of Medical Supplies

We have to make better use of what we have.

By Scott Duke Kominers

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There might be a better way *Photographer: Sascha Schuermann/Getty Images Europe*

Countries around the world have been scrambling to scale up production of essential medical supplies in response to the coronavirus pandemic. Even so, hospitals have been running out of critical-care facilities and equipment -- and that's forcing them to make tough decisions as doctors prioritize whom to treat.

These aren't fun questions to think about. But they're quickly becoming part of our reality. Doctors in Italy issued guidance last month for how to triage patients. And teams of U.S. medical ethicists recently published their recommendations in the New England Journal of Medicine.

I'm not a doctor, much less an expert in medical ethics. But I am trained in market design, a field that has taught us that managing resource allocation requires careful attention to economic principles.

This sort of thinking has already proven invaluable in medical-allocation programs such as those that match patient-donor pairs for life-saving kidney transplants. <sup>[1]</sup> And, as my colleague and collaborator Tayfun Sonmez of Boston College has pointed out, market design can help us think about coronavirus-related allocation problems, too.

In many cases, market design reinforces the recommendations doctors have already made -- and in a couple of instances, it suggests potential improvements.

For example, one of the U.S. medical ethics teams I mentioned above suggested eschewing first-come, first-served treatment models because of fairness issues: first-come, first-served may favor patients who live closer to health-care facilities, or mean that scarce medical resources might not be available for later, potentially sicker patients.

That's true, but we should also be worried about first-come, first-served because of the incentives it generates to be the first to gain access. If we allocate care on this basis, for example, doctors might start moving their patients into and through the pipeline a bit earlier than they would otherwise; this could lead us to run out of key resources even faster -- a phenomenon that economists call "unraveling."

That doesn't mean we shouldn't use the scarce resources we have as much as we can, of course. But it does mean that when they become available, we shouldn't necessarily always allocate them to the patients who arrived at the hospital first.

It's also worth noting that first-come, first-served means that patients who get sick earlier could have more treatment options. That could, in theory, marginally reduce people's incentive to follow the social-distancing norms we have worked so hard to put in place.

Meanwhile, as Sonmez has also noted, seemingly small changes in the objective can have a substantial impact. Medical ethicists have been thinking about, for example, whether we should aim to maximize the number of lives saved or the number of years lived by the patients who survive. Either way, we might want to weight our decisions by metrics such as the expected number of days of critical-care treatment a patient needs for recovery. <sup>[2]</sup>

Many also support the idea of prioritizing treatment for medical professionals so they can get back to caring for other patients, as well as trying to guarantee care for those participating in coronavirus treatment and vaccine trials. Economics highlights that these policies have dynamic benefits, as well: Helping doctors recover increases the number of patients that can be treated. Meanwhile, ensuring care for those volunteering for medical trials would reduce the risk of participating in those trials in the first place.

That said, some are concerned that setting up a fixed-priority rule might cause us to end up excluding some groups from care. To get around this problem Sonmez along with Parag A. Pathak, M. Utku Unver and M. Bumin Yenmez suggest reserving some of each resource, say, beds in intensive care units, for different types of patients. Then, whenever a unit in a particular reserve becomes available, patients in the associated category can be considered first; if no such patients are in need at that time, the unit can be allocated through a general pool. 3

Last, market design points to a role for coordination across hospitals: Scarce resources can be allocated much more effectively when decision-makers can see the full picture of who is in need. That's been a key conclusion of the research on kidney transplants, where it's been found that we can save many more lives with a national registry of patients and potential donors.

Economists Simon Loertscher and Leslie M. Marx have proposed a similar sort of registry to temporarily reallocate ventilators from places where cases haven't yet peaked to those where they have, helping to maximize the number of patients treated. Indeed, some such reallocations have already been taking place, with Oregon lending ventilators to New York.

Of course, the real goal is to fix resource shortages so we don't have to think about who gets what under pressing conditions like we're seeing now. But in the meantime, some thinking about market design might help us do the best we can with what we have.

- 1 More broadly, market designers have been rallying together to think about a range of resource-allocation problems resulting from the coronavirus crisis; see, for example, this white paper from a team in Sweden.
- 2 Doctors almost certainly take this into consideration implicitly, at least to some degree -- but it's worth thinking about explicitly as we codify guidelines and procedures.
- 3 Similar programs are used both in kidney transplantation and in school choice. There are subtleties in designing these sorts of systems, however: how should we think about patients who potentially qualify for multiple different reserve categories? That's a key issue Sonmez and his collaborators tackle in their work.

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