

# Mitigating Inequities and Saving Lives with ICU Triage during the COVID-19 Pandemic

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## Abstract

The burdens of the coronavirus disease (COVID-19) pandemic have fallen disproportionately on disadvantaged groups, including the poor and Black, Latinx, and Indigenous communities. There is substantial concern that the use of existing ICU triage protocols to allocate scarce ventilators and critical care resources—most of which are designed to save as many lives as possible—may compound these inequities. As governments and health systems revisit their triage guidelines in the context of impending resource shortages, scholars have advocated a range of alternative allocation strategies, including the use of a random lottery to give all patients in need an equal chance of ICU treatment. However, both the save-the-most-lives approach and random allocation are seriously flawed. In this Perspective, we argue that ICU triage policies

should simultaneously promote population health outcomes and mitigate health inequities. These ethical goals are sometimes in conflict, which will require balancing the goals of maximizing the number of lives saved and distributing health benefits equitably across society. We recommend three strategies to mitigate health inequities during ICU triage: introducing a correction factor into patients' triage scores to reduce the impact of baseline structural inequities; giving heightened priority to individuals in essential, high-risk occupations; and rejecting use of longer-term life expectancy and categorical exclusions as allocation criteria. We present a practical triage framework that incorporates these strategies and attends to the twin public health goals of promoting population health and social justice.

**Keywords:** COVID-19; ethics; critical care; triage; public health

The first wave of the coronavirus disease (COVID-19) pandemic revealed that even well-resourced countries may not have enough ventilators and critical care resources to treat all critically ill patients in need. In February 2020, ICUs in northern Italy were so overwhelmed with patients with COVID-19–associated acute respiratory failure that physicians had to make difficult choices about who would receive ventilator support and who would not (1). Weeks later, hospitals in New York City faced similar shortages; overt triage

was only averted because hospitals took unprecedented steps to increase their critical care capacity (2, 3). Table 1 presents a clinical vignette that illustrates the difficult choices clinicians face when there are not enough ICU resources for all patients who may benefit from them.

Many governments and health systems developed triage guidelines to prioritize who should receive scarce critical care resources when not all can (4, 5). Although the various guidelines differ in their details, all are firmly grounded in the utilitarian goal

of efficiency: maximizing the number of lives saved and, in some cases, maximizing the number of life-years saved. However, disadvantaged groups, such as persons of color and the poor, are dying at disproportionately high rates—not because of innate biological differences but because structural inequities place them at higher risk of contracting and dying of COVID-19 (6). Critics argue that many existing triage protocols would amplify these disparities, because disadvantaged groups have more medical comorbidities that would lessen

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their priority in “save-the-most-lives” triage protocols (7).

As governments and health systems prepare for expected surges of COVID-19 cases, commentators have proposed several modifications to allocation protocols to promote social justice, including directly prioritizing racial minorities (8), prioritizing those from disadvantaged communities (9), and abandoning duration of benefit as a triage criterion (10). However, no comprehensive triage frameworks have been published that propose actionable strategies to accomplish equity goals. In fact, one ethicist recently argued that it is unrealistic to attempt to redress the social determinants of health during ICU triage and therefore that the fairest strategy would be to use a random lottery to allocate scarce ICU beds and ventilators (11).

In this Perspective, we argue that there are indeed important equity problems with current triage protocols that need to be corrected, including with a model policy we developed that has been widely adopted across the United States (12). These triage protocols are applicable to both the current COVID-19 pandemic and to future respiratory pandemics. We urge that triage guidelines should balance two ethical goals that are sometimes in conflict: promoting population health outcomes (efficiency) and promoting justice (equity). We recommend three equity-focused triage considerations and a practical triage framework that attends to the twin public health goals.

## Disproportionate Impact of the Pandemic on Disadvantaged Communities

The COVID-19 pandemic has laid bare the deep inequities in U.S. society that cause worse health outcomes among disadvantaged groups. Nationally, Black, Latinx, and Indigenous individuals are significantly more likely to be infected, hospitalized, and die of COVID-19 than white individuals (13–16). In Ohio, Black individuals make up only 13% of the population but 32% of all COVID-19 hospitalizations; similar trends have been observed in numerous states in the United States (17). In a rigorous state-wide study in Indiana, the infection fatality rate was three times higher in nonwhite patients than in white patients (18).

The pandemic has also disproportionately impacted individuals from economically disadvantaged areas. For example, in New York City, COVID-19 mortality rates are 2.4 times higher in high-poverty populations than in low-poverty populations (242 deaths per 100,000 vs. 104 deaths per 100,000, respectively) (19). This is likely caused by factors such as the infeasibility of social distancing in densely populated neighborhoods and households, and the need to continue to work in public-facing occupations because of economic hardship (20–22).

There is no evidence that innate biological differences between races—or between the rich and the poor—explain the disproportionate impact of COVID-19 on disadvantaged populations. Instead, recent studies have found that factors linked to structural inequities, such as comorbid medical conditions and socioeconomic disadvantage, are the main drivers of the higher death rates among Black patients (6). In other words, the high mortality rates among disadvantaged groups arise from unjust, avoidable differences in the “social conditions in which people are born, grow, live, work, and age” (20–23). These social determinants of health include differential access to health care, job opportunities, income, education, and housing quality, as well as racial discrimination and unfair social patterns of power and advantage (24).

## Critique of Existing Allocation Frameworks

### Problems with a Save-the-Most-Lives Strategy

There are concerns that current triage guidelines may amplify the disproportionate burden of the pandemic on disadvantaged groups. Many triage protocols are primarily designed to save as many lives as possible, typically by using a mortality prediction model to give priority for scarce ventilators to patients most likely to survive to hospital discharge. For example, New Mexico recommends using the Sequential Organ Failure Assessment score to prioritize patients most likely to survive to hospital discharge with intensive treatment (5, 25). The Society of Critical Care Medicine also recommends using a physiology-based predictive score to allocate ventilators so that “those most likely to benefit from a given resource are assigned priority based on the premise of the greatest good for the greatest

number” (26). The Swiss Society of Intensive Care Medicine recommends that “all measures are guided by the aim of minimizing the number of deaths” and proposes several steps to identify patients whose prognosis for hospital survival is poor (27).

Other frameworks go further to also attempt to increase overall life-years saved. For example, triage guidelines from the Italian Society of Anesthesia, Analgesia, Resuscitation, and Intensive Care instruct physicians to “save limited resources . . . for those who have a much greater probability of survival and life expectancy, to maximize the benefits for the largest number of people” (28). The Canadian Medical Association recommends that “priority for limited resources should aim both at saving the most lives and at maximizing improvements in individuals’ posttreatment length of life” (29). An early version of a model hospital policy from the University of Pittsburgh gave lower priority to patients expected to die within several years from a severe underlying illness (12).

Although at first glance it seems unproblematic to focus on saving as many lives as possible with scarce critical care resources, this approach may disproportionately deny critical care treatment to persons of color and the poor (Table 1). The reason is that these disadvantaged groups have more medical comorbidities, such as congestive heart failure and chronic kidney disease, which arise from structural inequities and worsen their hospital survival probabilities (30).

Similarly, triage policies that seek to maximize life-years saved will compound the disadvantage experienced by individuals in whom structural inequities have led to shorter life expectancies. For example, the higher prevalence of chronic medical conditions among Black individuals in the United States causes them to have significantly shorter overall life expectancies than white individuals (an average of 5 yr shorter). The vast majority of this difference (70–80%) is explained by socioeconomic disparities across races (31). Prioritizing patients who would gain the most years of life would also disadvantage individuals with disabilities that somewhat shorten their life expectancy, yet who stand to gain important benefits from treatment (32).

Paradoxically, a utilitarian focus on saving the most lives or life-years during the pandemic may work against the “common good” of society, which is the standard goal of utilitarianism, by fueling inequitable

**Table 1.** When There Are Not Enough ICU Beds and Ventilators for All Patients in Need

Description of Patients in Need of ICU Care and Mechanical Ventilation	Patient Priority for ICU Admission under Different Allocation Frameworks		
	Save-the-Most-Lives Strategy*†	Random Allocation‡	Hybrid Efficiency–Equity Strategy§
<b>Patient 1:</b> 71-yr-old white woman with no significant past medical history who is admitted with acute respiratory failure, mild delirium, and acute kidney injury from COVID-19. Predicted hospital mortality is 30–40%. She is not an essential worker and is not from a disadvantaged community (ADI = 1).	2	Equal chances	2
<b>Patient 2:</b> 49-yr-old Black man with end-stage renal disease because of poorly controlled hypertension and diabetes who is admitted with acute respiratory failure and severe delirium from COVID-19. Predicted hospital mortality is 50–60%. He is an essential worker who drives elderly and disabled patients to their medical appointments. He lives in a disadvantaged neighborhood (ADI = 10) and cannot reliably afford the prescription drugs needed for his medical conditions.	3	Equal chances	1
<b>Patient 3:</b> 85-yr-old white man with widely metastatic cancer who is expected to die within 6 mo, admitted with a COPD exacerbation and respiratory failure (COVID-19 negative). Predicted hospital mortality is <25%. He is not an essential worker and is not from a disadvantaged community (ADI = 4).	1	Equal chances	3

*Definition of abbreviations:* ADI = area deprivation index; COPD = chronic obstructive pulmonary disease; COVID-19 = coronavirus disease. Scenario: The COVID-19 pandemic has caused severe shortages of ventilators and ICU beds at your hospital. The regional government (e.g., state or province) has declared a public health emergency and authorized crisis standards of care. All hospitals in the region are experiencing the same shortages of ICU resources. Patients are receiving mechanical ventilation in step-down units and in operating rooms that have been repurposed to function as ICUs. All nonemergency surgical cases have been canceled. Despite these measures, all but one of the hospital’s ventilators are being used by patients who would die without them and none have been deemed to be clearly failing treatment. Which of the three patients described in this table should be prioritized to receive the last available ventilator?

\*Specified as giving priority according to a patient’s chances of survival to hospital discharge.  
 †Under the save-the-most-lives approach, the only relevant allocation criterion is patients’ chances for survival to hospital discharge. Therefore, patient 3 would receive top priority because he has the best chance of survival to hospital discharge, followed by patient 1, then patient 2.  
 ‡Under random allocation, each patient is given an equal chance to receive the scarce resource.  
 §Specified according to triage framework described in Table 3.

||Under the hybrid efficiency–equity approach, Patient 2 would receive highest priority because his triage score is the most favorable (triage score = 1, which is achieved by +3 points for prognosis for hospital survival, –1 point for essential worker status, and –1 point for correction for structural inequities based on high ADI score). Patient 1 would receive second priority because her Triage Priority Score is the second-most favorable (triage score = 2, which is achieved by +2 points for prognosis for hospital survival and no adjustments because she is neither an essential worker nor from a high-ADI community). Patient 3 would receive third priority because he has the least favorable triage score (triage score = 5, which is achieved by +1 for prognosis for hospital survival, +4 points because he is expected to die within a year from an end-stage medical condition, and no other adjustments because he is neither an essential worker nor from a high-ADI community).

outcomes. Worsening inequities among disadvantaged groups may lead to loss of social cohesion, public mistrust, and societal unwillingness to follow restrictive public health measures (33), which could lead to further loss of life (34).

**Problems with a Random Allocation Strategy**

In response to concerns that save-the-most-lives triage policies may amplify inequities, some scholars have argued that the only fair

approach to allocating scarce ventilators during the pandemic is by random allocation (11). Under this approach, if there were two patients in need of a ventilator and only one ventilator available, a coin flip or other random selection process would determine who received mechanical ventilation and who received only comfort-focused care (Table 1).

There are three main concerns with random allocation of scarce ICU resources. First, random allocation would result in

many more deaths than an approach that considered a patient’s chances of survival. A random lottery would give identical priority to a patient with a very poor prognosis and a patient with an excellent prognosis (e.g., an 85-yr-old patient with a 90% chance of in-hospital death would receive priority equal to an otherwise healthy 17-yr-old patient who presents with single-organ failure and an excellent prognosis). Most people would agree that patients with an excellent prognosis for

**Table 2.** Strategies to Promote Justice in ICU Triage**Modifications to existing triage guidelines:**

1. Use a correction factor to reduce the impact of structural inequities.
2. Give heightened priority to all frontline essential workers, not just healthcare workers.
3. Do not use quality of life, long-term life expectancy, broad social worth, gender, race, ethnicity, disability status, or sexual orientation as triage criteria or categorical exclusion criteria.

**Procedural justice considerations:**

1. Engage diverse communities when developing triage policies.
2. Ensure that triage teams receive training in implicit bias, health equity, and antiracism.
3. Blind triage team to ethically irrelevant patient characteristics.
4. Establish a real-time review of triage decisions to monitor for bias or inequitable outcomes.

**Considerations at the state level:**

1. Prioritize safety net hospitals and others that serve disproportionately disadvantaged populations to receive additional ventilators from the state and national stockpiles.
2. Ensure that robust interhospital transfer mechanisms are used to transfer patients from overwhelmed safety net hospital to better-resourced hospitals.

survival with treatment should be given priority over those with a poor prognosis on the grounds that, all other things being equal, it is desirable to save more lives rather than fewer (35, 36).

Importantly, random allocation of scarce ventilators would almost certainly also result in fewer lives saved among disadvantaged groups compared with strategies that consider survival prognosis (37). For example, fewer overall lives of Black patients would be saved with random allocation because Black patients with a very poor prognosis for survival would receive priority for treatment equal to Black patients with an excellent survival prognosis, resulting in more treatment of patients likely to die regardless and less frequent treatment of Black patients likely to survive if their acute illness if treated.

Second, random allocation would not actually *mitigate* disparities in COVID-19 outcomes; it would only prevent additional *increases* in disparities. This is because the source of the inequitable death rates from COVID-19 occurs “upstream” from the ICU; certain groups, such as Black and Latinx patients, are far more likely to develop an infection requiring ICU care than nondisadvantaged patients. Therefore, enacting equal treatment *at the time critical illness develops* will bake in the baseline inequities rather than redress them.

Third, random allocation does not attend to justice-focused considerations widely viewed to be important when allocating scarce resources during a pandemic, such as giving priority to those who assume risk to benefit

society (e.g., essential workers in risky, public-facing occupations) (38) and giving priority to the worst off (24, 39) (e.g., those who will have lived the shortest lives if they die during the pandemic) (40).

### Dual Ethical Goals of Triage in a Pandemic

To develop sound ICU triage policies, a critical first step is to articulate the ethical goals of triage. Triage during a pandemic is a public health intervention that is authorized by state laws and government declarations of a public health emergency (41). Triage therefore should be designed to achieve the ethical goals of public health.

The overarching ethical goal of public health is not solely to improve the aggregate health outcomes of populations, but also to do so in ways that reduce inequities in the distribution of health benefits (42, 43). The World Health Organization and the National Academy of Sciences, Engineering, and Medicine have identified redressing health inequities as a critical goal of public health (44, 45). Prominent theories of public health ethics assert the importance of attending to justice considerations while promoting population health (24, 39). For example, Faden and Powers argue that “twin moral impulses animate public health: to improve human well-being by improving health and to do so in particular by focusing on the needs of those who are the most disadvantaged” (24). Taking steps to reduce health

inequities shows equal respect for all members of society by mitigating the negative social circumstances that cause disadvantaged persons to bear the greatest health burden (46).

It is important to note that the ethical goals of public health differ in emphasis from those of clinical medicine, which emphasize physicians’ fiduciary obligations to individual patients more than advancing population health. Moreover, although some clinicians and medical ethicists may object to allowing social (i.e., nonmedical) considerations to influence usual clinical care, doing so is the norm in public health interventions, which often seek to address the social determinants of health (24).

Alternatively, some may accept that it is permissible to consider social factors when allocating certain preventive resources during a public health emergency (e.g., scarce vaccines), but object to doing so with a (potentially) immediately life-saving resource (e.g., scarce ventilators or life-saving medications). To be sure, the deaths that arise in relation to ICU triage decisions will occur among identifiable patients immediately before our eyes and therefore may feel more distressing than the deaths that arise among unidentifiable (but real) statistical lives of persons who die after not being allocated a scarce vaccine and subsequently contracting COVID-19 (47, 48). However, this psychological difficulty of choosing among identifiable lives is not an ethically persuasive reason to disregard equity concerns during triage. Instead, there are other strategies to mitigate clinicians’ psychological distress, such as the use of triage teams to make triage decisions, as described below.

### Strategies to Promote Fairness during Triage

In this view of public health ethics, ICU triage in a pandemic must attend to both efficiency goals (e.g., saving lives) and equity goals (e.g., mitigating the effects of structural injustices that contribute to inequitable outcomes). We recommend three modifications to existing triage policies to promote equity, deployed at the level of individual hospitals. We also make four procedural justice recommendations and two considerations that are deployed at the regional level, rather than within individual hospitals (Table 2).



## Modifications to Existing Triage Guidelines

### Use a Correction Factor to Reduce the Impact of Structural Inequities

One strategy to mitigate disparities in COVID-19 outcomes is to add a correction factor to triage scores for patients who have experienced high levels of disadvantage arising from structural inequities. It would be infeasible during ICU triage to conduct a detailed assessment of each patient's individual degree of disadvantage. However, it would be feasible to use an established composite measure of disadvantage. One such measure is the area deprivation index (ADI) (49), which is a geographic measure of socioeconomic disadvantage in the United States that is calculated at the level of census blocks (approximately 1,500 people). It creates an aggregate score of disadvantage on a 10-point scale, based on 17 measures of disadvantage related to poverty, education, employment, physical environment, and infrastructure within a neighborhood. The ADI is publicly accessible and is determined by entering a patient's home address into an online calculator (50). It takes less than a minute to determine a patient's ADI score. Because the strongest association between ADI scores and health outcomes occurs at the highest levels of disadvantage, one way to operationalize this disparity-mitigating strategy would be to incorporate an adjustment into the triage score for individuals who reside in the most disadvantaged neighborhoods (i.e., ADI scores of 8, 9, or 10). Similar geographic measures of social deprivation are available for use in other countries (51–53).

Some commentators have advocated using patients' race and ethnicity to correct for structural inequities (8). However, in the United States, there are major legal and political barriers to considering patients' individual race and ethnicity in allocation strategies (54, 55).

### Give Priority to High-Risk Essential Workers

A second strategy is to give heightened priority to individuals who work in frontline roles deemed essential by state and federal governments (56). Rather than extending this priority only to frontline clinicians, it should be given to all workers in essential jobs that face high risk of infection because of frequent

workplace exposures, such as grocery store workers, bus drivers, home health workers, and food service workers. Although the main ethical justification for this criterion is reciprocity for the risk associated with performing critical societal tasks during the pandemic, it would mitigate disparities because persons of color and socioeconomic disadvantage are overrepresented in the essential jobs most highly associated with COVID-19 mortality (21). This criterion can be operationalized by using state-specific lists of essential businesses that are required to continue in-person operations during the pandemic (57).

### Reject Longer-Term Survival as an Allocation Criterion

A third strategy to promote equity in triage guidelines is to reject longer-term life expectancy as an allocation criterion (7, 10). Although strategies that give higher priority to patients with a longer life expectancy would likely result in more overall life-years saved, it would unfairly disadvantage the poor and persons of color, who have shorter life expectancies because of structural inequities. This criterion would also unfairly disadvantage individuals with life-shortening disabilities (32, 58). One way to balance the need for equity with the need to promote population health outcomes is to give lower priority during triage to patients expected to die in the near term (e.g., within a year) from an end-stage medical condition, on the basis of objective medical evidence, but make no other distinctions based on patient's predicted life expectancy. This criterion is similar to how duration of benefit is incorporated into allocation of scarce lungs for transplantation (59).

### Considerations at the State Level

The three disparity-mitigating steps we described above are each microallocation strategies, applied at the level of individual patients within hospitals. However, macroallocation strategies—deployed at the state or federal level—could prevent inequitable outcomes. First, government officials should ensure that safety net hospitals receive additional ventilators from the strategic national stockpile and other sources to lessen the chance that these hospitals must deny disadvantaged patients life-saving care (60). Second, governments should ensure that interhospital transfer mechanisms are established and aggressively used to transfer patients from overwhelmed safety net hospital to better-resourced hospitals (61). This strategy proved critical in Arizona, where many patients, including

some from the Navajo Nation, were transferred to hospitals in New Mexico when Arizona hospitals were unable to accommodate all patients in need (62).

## ICU Triage Framework Grounded in Population Health and Social Justice

Table 3 presents a triage framework that is designed to simultaneously promote population health outcomes (i.e., utility) and mitigate disparities (i.e., equity). This example illustrates one possible way to integrate multiple ethical considerations into triage decisions that is feasible within the time-constrained circumstances of ICU triage. It is designed for the United States, where baseline health inequities are severe. We sought to achieve meaningful corrections for equity while still ensuring that other populations have meaningful access to ICU care (Table 1). There are likely other reasonable strategies to combine and balance these ethical considerations. For example, in societies with equitable access to health care and little evidence of health disparities, it may be reasonable to refrain from including a correction factor into triage scores for structural inequities. Robust public engagement will be a critical step in determining how a particular society will balance efficiency and equity in triage, because the public will bear the consequences of triage policies and needs to trust that the policies are fair (35, 36).

A trained triage team should assign each patient a Triage Priority Score on an 8-point scale, with lower scores indicating higher priority. The rationale for using a triage team rather than requiring that treating clinicians make triage decisions is to ensure consistent application of triage criteria, to allow clinicians to maintain their traditional clinical role as advocates for patients and families, and to minimize clinicians' moral distress (12, 63). Rather than using exclusion criteria, all patients who would normally be eligible for ICU care remain eligible; the supply of available ventilators determines how many patients can be treated.

Population health is promoted through two allocation criteria. First, points are assigned based on patients' chances of in-hospital mortality using a quantitative mortality prediction tool. Although there are growing concerns about using the

**Table 3.** Triage Framework to Promote Population Health Outcomes and Justice

Principle	Criterion	Point System*			
		+1	+2	+3	+4
<b>Promote population health outcomes</b>	1. Prognosis for hospital survival (assessed using a validated severity-of-illness score) <sup>†</sup>	Quartile 1: lowest risk of death (i.e., risk of death <25%)	Quartile 2 (i.e., risk of death 25–49%)	Quartile 3 (i.e., risk of death 50–75%)	Quartile 4: highest risk of death (i.e., risk of death >75%)
	2. Presence of end-stage medical condition (medical assessment of near-term prognosis)	—	—	—	Death expected within 1 yr from end-stage condition
<b>Promote justice/equity</b>	1. Correction for structural inequities using ADI	Subtract one point from the Triage Priority Score if the patient’s ADI score is 8, 9, or 10 (on a 1–10 scale)			
	2. Priority to frontline essential workers	Subtract one point from the Triage Priority Score if the patient is an essential worker in a high-risk occupation			
	3. Priority to those who’ve had the least chance to live through life’s stages	Tiebreaker: In the event that two patients have identical Triage Priority Scores, give priority to the younger patient when a significant age difference exists			
	4. Equal chances	Second tiebreaker: In the event that two patients have identical Triage Priority Scores and are of similar ages, use random selection to determine who receives the resource			

*Definition of abbreviation:* ADI = area deprivation index.

\*Scores range from 1 to 8, and persons with the lowest score would be given the highest priority to receive critical care beds and services. An alternative scoring approach is to allow the minimum score to be as low as –1 (e.g., a patient with a low risk of hospital mortality, is not expected to die within a year, is an essential worker, and is from a high-ADI area). Allowing scores to be as low as –1 would likely result in a larger disparity-mitigating effect.

<sup>†</sup>Severity-of-illness scores should be adjusted for individuals with disabilities that cause baseline impairments that increase their calculated illness severity score but do not substantially impact their chances for near-term survival (e.g., a patient with a language impairment from autism or cerebral palsy should not have their Glasgow Coma Scale score negatively affected by their baseline speech impairment because it does not affect their prognosis for near-term survival).

Sequential Organ Failure Assessment score for triage in a pandemic (64), there are benefits to using some sort of an objective mortality prediction tool rather than physicians’ individual judgments, which are subject to a variety of biases. Further research is needed to determine the best mortality prediction tool. Second, additional points are assigned if a patient has an end-stage condition such that they are expected to die within a year regardless of treatment.

To promote equity, factors that would unfairly disadvantage certain groups are rejected, including perceived quality of life, long-term life expectancy, broad social worth, gender, and sexual orientation.

To correct for the negative impact of structural inequities on health status, one point is subtracted from the Triage Priority Score of patients from highly disadvantaged communities, using the ADI to identify individuals residing in a neighborhood in the highest quartile of socioeconomic disadvantage.

Next, rather than giving heightened priority only to healthcare workers, priority should be given to all individuals

performing frontline essential jobs that put them at significantly increased risk for COVID-19 in the form of subtracting one point from their Triage Priority Score.

In the event of ties between patients with identical Triage Priority Scores, priority should go to younger patients because they have had the least opportunity to live through life’s stages (65–67). If a second tiebreaker is needed, random allocation should be used because it gives equal chances to patients who are ethically similar.

**Response to Potential Objections**

Some may argue that it is infeasible or inappropriate to attempt to mitigate inequities during the time-pressured circumstances of allocating scarce resources during a pandemic. However, recent experience using similar criteria to allocate scarce remdesivir for inpatients in a large U.S. health system suggests it is feasible (68). Moreover, the National Academy of Medicine endorsed similar disparity-mitigating criteria in its recommendations

for allocating scarce vaccines during the pandemic (45).

Second, some may argue that it is inappropriate to introduce equity considerations into triage frameworks if doing so might lead to fewer overall lives saved, such as giving heightened priority to individuals from disadvantaged areas who are, on average, more likely to die of COVID-19 despite intensive treatment than individuals without comorbidities. In our view, when society is substantially responsible for creating disparities through unfair social policies, there is a special obligation to prioritize disparity mitigation, even if doing so results in somewhat fewer overall lives saved compared with purely utilitarian triage.

Third, some may argue that the relative weights we propose for the allocation criteria (e.g., a 1-point deduction in some individuals’ triage scores to correct for structural inequities) may not be appropriate outside the United States, which has a particularly high degree of health disparities. We agree that the precise balancing of efficiency and equity in triage

may reasonably differ from country to country. However, many countries have significant health disparities within their populations, including among racial and ethnic minorities. Our broader point is that no reasonable triage framework would focus solely on maximizing health outcomes if doing so created significant inequities in health outcomes. Daniels and colleagues have argued that the best path in the face of underlying moral disagreements about priorities is to strive for procedural justice through a fair decision-making process in policy development. Under this approach, decisions made according to established procedural criteria (e.g., publicity, appeals to reasons all can accept as relevant, accountability) are judged to be accountable for reasonableness (69). Moreover, public engagement is critical and there are excellent examples of deliberative democratic techniques for priority setting (35, 36).

Fourth, some may argue for some clinician discretion and flexibility in

determining triage scores, such as when it seems clear that a patient's prognosis is significantly better or worse than predicted by the quantitative mortality predictor. Although a full discussion of this issue is beyond the scope of this paper, one strategy is to use a fair appeals process in such cases.

Fifth, some may wonder whether these disparity-mitigating interventions will actually achieve their intended goals. Because there has not yet been a widespread need for ICU triage, there are few empirical data about the actual effect of any allocation framework. We recommend efforts to estimate the effects through computer-based modeling exercises, as well as through "tabletop" exercises in which the triage framework is applied to actual hospitalized patients, but triage decisions are not enacted, to determine the probable effects. It will also be critical for governments to require disparate-impact monitoring of triage, which should include quantitative reporting of how triage is actually affecting

outcomes among structurally disadvantaged groups.

## Conclusions

The COVID-19 pandemic has disproportionately impacted disadvantaged groups, such as the poor and persons of color, because of structural inequities like poor healthcare access and unhealthy living conditions. Most existing ICU triage guidelines, if implemented, may amplify rather than mitigate these inequities. During a pandemic, society has ethical obligations to allocate scarce resources to both promote population health outcomes and guard against inequitable outcomes. The ICU triage framework we propose is a practical way to promote these two important ethical goals. ■

**Author disclosures** are available with the text of this article at [www.atsjournals.org](http://www.atsjournals.org).

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