# Analyze the Dilemma of Distributing Scarce Medical Resources During the COVID-19 Pandemic Based on Different Ethical Theories

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**Abstract.** The COVID-19 pandemic poses enormous challenges for the healthcare system of the entire world. In many places, the existing medical resources cannot meet the needs of all patients, and clinicians must choose between different patients, resulting in the moral dilemmas of fair distribution. This paper focuses on the various ethical principles used to guide the allocation of scarce resources in the past and discusses how these principles can be applied during the COVID-19 pandemic, such as treating all people equally, first consider the worse-off group, maximizing the total benefits, and reward the group making the largest contribution. Generally, no single ethical principle is sufficient to cover all moral considerations, and the distribution policies during the pandemic must balance different principles, such as egalitarianism and utilitarianism. Current ethical guidance on the triage decision is not perfect, and further improvement is needed. There are few studies specifically explored how policies balanced ethical rules in different ways resulting in differences in society. Future research in this field should work to deal with these limitations.

**Keywords:** COVID-19; Scarce resources allocation; Ethical principles.

## 1. Introduction

The COVID-19 outbreak has influenced almost the whole world and caused significant negative impact on the world's health and economy. Since first reported, more than 500 million people all over the world was infected by the corona-virus and more than 6 million of them died because of it [1]. The pandemic leads to a global challenge in universal health, society, and economy. People usually cannot cover all the aspects while dealing with such a lot of problems, where in some cases, they have to choose to protect the interest of some people other than the other. These are hard choices, decision-makers often face a conflict of moral theories. For instance, using limited resources to prioritize the severely ill is consistent with the values of caring for the vulnerable, but it violates the ethic of equity, as not every patient gets the same opportunity of getting the treatment.

Because of the unprecedented scale of the pandemic, different parts of society face brand new moral challenges. And this challenge is particularly difficult and can be important for healthcare systems and clinicians worldwide. In the full epidemic outbreak stage, the global medical system is faced with a shortage of emergency medical resources, which means that not all patients can receive the most-timely care [2-4]. In this situation, the decision made by the healthcare system and the clinicians have a direct influence on which and how many patients can get the medical resource. Currently, there is only limited research focused on moral decisions making during the pandemic. This is an area that is worth further research. Although as the pandemic is winding down, the medical resource shortage is not as large a problem as it was at the beginning, it is still important to study and summarize the ethical decisions made during this pandemic and their impact. These experiences can help us to establish clearer moral guidelines for people to respond to similar moral dilemmas in the future.

This paper discusses moral dilemmas of fair distribution in response to medical resources shortages during the COVID-19 pandemic. It focuses different ethical principle that previously used to guide the scarce resource allocation, and examines how these principles applied in the current pandemic. The paper starts with a general overview of the shortage of health care resources faced by countries during the pandemic. Then it discusses how different moral principles guide the allocation

decision and what are the advantages and disadvantages of different resource allocation principles. As different countries take different specific allocation approaches, the paper also discusses the influence of these specific policies. Finally, the paper suggests improving the current ethical guidelines to cope with allocating scarce medical resources for similar future situations.

## 2. The Resources Shortage and Fairness Moral Dilemma

When The allocation of scarce resources is one large moral problem during the pandemic. With the increasing number of infected cases, there is a growth in the demand for healthcare resources, bringing large challenges to the health system. There was a shortage of basic personal protective equipment (PPE) earlier in pandemic, including gloves, goggles, hospital gowns and surgical masks. At the end of 2019, due to the spread of the coronavirus in Hubei province, China reduced the medical export to meet the domestic need [5]. As China is a significant part of the world’ s supply chain of PPE, its reduction in medical export leads to a chain effect in the countries which previously relied on importing PPE from China. With the global spread of the pandemic, the United States and many countries in Europe all have been hit hard. The increased need and decreased export from China create a large gap between PPE's demand and supplies, leading to a price explosion of PPE in these countries. Compared to the end of 2019, for Europe Union in April 2020, the price of masks and respirators from China has increased by 1250%, and the price of the protective garment has risen by 700% [6].

With the further development and expansion of the epidemic, more types of medical resources were running short. In many countries, the number of patients has exceeded the hospital's capacity. Even in developed countries such as Britain, France, and the United States, there are insufficient ICU beds, which corresponded with relatively high incidences of COVID-19 deaths [4]. With very limited medical resources, society faced an ethical dilemma of fairness: Who should get the resources first? Who should be treated first?

## 3. Ethical Allocations of Resources

With limited medical resources, it is hard to manage all needy people. And there is an inevitable need for decisions to allocate the limited resources and balance across the society. Both the policymakers and the clinicians urgently need to make a series of standardized rules to set the prioritization order and guide the split flow of the patients. Considering the benefits of each patient, one critical issue to consider in these policies is the distributive justice. Previous studies have proposed many principles to guide the allocation decisions of health care resources, which represents different explanations of distributive justice. These interpretations mainly based on three moral theories, egalitarianism, prioritarianism and utilitarianism. For example, Persad and colleagues concludes four basic types of ethical principles for allocation: (1) treating all people equally, (2) first consider the worse-off group, (3) maximizing the total benefits, and (4) reward the group making the largest contribution [7]. Previous study and review about the allocation of resources during pandemics generally built on these ideas. The following part of the paper will discuss these moral theories and their extended allocation principles, and also analyze their application under the context of pandemic.

### 3.1 Egalitarianism: Treating All People Equally

“Treating all people equally” is the ethical approach that aims to give all patients the same opportunity to get medical resources regardless of the patient’ s personal condition. Two common examples of the approach are “first-come, first-served” and lottery. In these cases, deciding who should get the resources is relatively easy as it does not involve subjective decisions. And the reason for making the decision is clear to both the clinician and the patients. It is, therefore, less stressful for the clinicians to decide to save one person instead of another. It also reduces the possibility of medical disputes.

However, researchers generally believe that the "first-come, first-serve" rule should not be applied to the pandemic situation [2,7]. Although apparently, this rule allocates the resources only based on the time patients get to the hospital, in practice, it would unfairly benefit people who are wealthier, with more access to faster transportation and newer information. The first-come, first-serve allocation of resources can also lead to extra panic, crowding and scramble, which is disastrous during this period when social distance is crucial.

Other problems also exist. The rule of both lottery and the "first-come, first-serve" strategy is very simple and largely ignores moral principles other than equality. Although the healthcare system can use a lottery to ensure everyone has the same opportunity, it may also become less efficient as people who receive the resources may not be the people most in need. In other words, the resources could have been used to save more people or people that makes larger contributions if not been allocated randomly.

### 3.2 Prioritarianism: First Consider the Worse-off Group

Aside from giving everyone the same opportunity, one commonly applied scheme is prioritising the most vulnerable group. For example, the Joint Committee on Vaccination and Immunization (JCVI) suggested the British government first allocate the limited life-saving resources to those most likely to become ill -- the sickest people, the elderly and the health care workers [8]. The rule originates from the theories of distributive justice which states that it is socially meaningful to give the priority to people with poorest health condition [9]. It protects the worse-off group, as these people are least likely to survive without the resources, while others may recover without having those resources. The previous study also shows that the approach stays consistent with social values. People were generally willing to give priority to severe patients with some expense of aggregate health [9].

Still, people argue that this is not the best medical resource allocation method as it does not take the prognosis into account [7]. Patients who need the ventilators and ICU beds were usually in the life-threatening conditions, and in this case, there is a higher cost to save a sicker person with little gains. These people need more medication, longer use of ventilators and ICU beds. However, even receiving the highest treatment priority, the hospital could still fail to save these patients, and they are still vulnerable even after being cured. More importantly, as the resources were limited, spending more on one group of people meant it would be even more difficult to save the rest.

### 3.3 Utilitarianism: Maximizing the Total Benefits

Given the obvious drawbacks of the two previous mentioned allocation methods, many scholars state that the most important goal during the pandemic should be maximizing the total benefit [2] [3]. Maximizing the total benefit is an approach of utilitarianism. It aims to maximize both the total lives saved and the life expectancy. On the one hand, with all other conditions equal, the utilitarian approach always tends to save three instead of one life. On the other hand, however, utilitarianism does not treat all lives with the same value. It also takes life expectancy into account. Saving a person who can live 50 more years is more valuable than saving someone who can only live 10 more years.

To apply such utilitarian approach, many healthcare economists use the quality-adjusted life years (QALY) scale to measure the quality of life years [3]. For instance, QALY states that the quality of life-years of a complete health person is more valuable than that of a person with mobility impairment [7]. According to QALY, 10 life years for people with moderate mobility only equals 8.5 life years of healthy people. QALY help guide resource allocation in sophisticated situations. The clinicians can quickly decide who the resources should be distributed to by maximizing the QALY. However, as one can imagine, QALY excessively focused on the equality of QALY instead of actual people. It sees all lives' value as a number, leading to systemic discrimination to group with low "life qualities".

### 3.4 Reward the Group Making the Largest Contribution

Rewarding people with larger contribution, to a large extend, is the supplement of utilitarianism [7]. This principle evaluates the contribution one has made or could made in the future, and prioritize

the “most useful” ones. The ultimate goal of this principle is to keep these individual contributing, and benefits the whole community.

Under the context of pandemic, clinical workers themselves are the the people who have made the greatest contribution to alleviating the scarcity of health care resources. These front-line workers are at high risk of infection, and is also difficult to replace because of the high level of expertise required. Therefore, it should be a unified consensus to first guarantee the medical supplies and treatment for the clinicians even when the general allocation principle is based on equality or protection of the weakest [2]. The shortage of health care resources can only be alleviated by first ensuring that clinicians continue to cure patients.

Other contributions are more controversial. For example, should a patient be prioritized if they are the only ones taking care of a family? While dealing with these problems, the principle faced similar problems as the previous utilitarian principle faced. The priority based on these types of contributions generally brings more benefit to the whole society, but life for people who are already disadvantaged, people with few families and friends already experiencing social isolation, is even more challenging.,

## 4. Influence of the Current Allocation Policy

Distributing scarce medical resources in the context of pandemic is a complex ethical problem. No single principle is sufficient to recognize all morally relevant considerations [7]. There is still a lot of debate about how to balance these principles. In this case, there is no universally accepted principle to guide the allocation of scarce resources, and several negative effects have resulted as a result.

### 4.1 Psychological Distress for Healthcare Professionals

Health care systems during pandemics were burdened because of inadequate resources. In this situation, clinicians need to face more patients. The ICU patients: nurse ratio in some UK hospital even increased from regular 1:1 to 6:1 [10] during the first wave of the pandemic. The shortage of personal protective equipment (PPE) also increases the clinicians’ actual and perceived risk of being infected, which further increases the stress. Additionally, because there were no uniform guiding rules for the scarce health care resources allocation, the clinicians often needed to face and solve the ethical dilemma themselves during the pandemic. Making these distressing moral decisions also brings considerable mental injury [11].

All these stressors adversely affect the clinicians’ mental health. Based on is theoretical analysis, a number of research has found health care workers were facing severe mental health problem during the pandemic [10,12].

### 4.2 Prejudice and Discrimination

The hardships of the pandemic have also exacerbated social inequality and discrimination. A critical influence of the ethical dilemma under pandemic is prejudice and discrimination. The pandemic has aggravated social inequalities between different races, ages, socioeconomic statuses, etc. Multiple vulnerable social communities have been affected by different degree of discrimination.

One group that has been particularly negatively affected is the older adults. Ageism is not a new topic. With the world's population aging, older adults have often been described as a burden on the country's economy, leading to common negative stereotypes toward the group [13].

Such stigmatization toward the elderly has been exacerbated during the pandemic. As one of the most vulnerable groups during the pandemic, treating the elderly is a critical topic in the fairness dilemma. With limited resources, people started to put life on a weighing scale, and the older adults seemed always to lose this competition. As people come to realize they can’t meet all healthcare needs, they start to tend toward the utilitarian idea of maximizing the total benefit [14]. Age was frequently used as the base of the hospital's triage decisions. The National Health Service (NHS) of the United Kingdom suggest a “score” tool based on age, frailty and underlying conditions to guide

the allocation of critical care [15]. With this tool, older aged people are more likely to be refused from intensive care. Hospital in countries with serious medical resources shortage like Italy also prioritize younger patients [16]. In Wales, the United Kingdom, some elderly patients with serious were even asked to sign a "do not attempt resuscitation" (DNAR) form to give up their rights to get emergency services such as chest compression and electrical shocks [17]. In these policies, all individuals over a certain age were seen as a homogenized, vulnerable group. It seems that their age alone is enough to suggest that their lives have a lower value, the individual difference within the age group was dismissed.

Media also contributes to Ageism. Aside from promoting the vulnerability of older populations, lot of news articles trumpeted cases of older people refusing to use Scarce medical resources to give younger people a chance to live [18]. Indeed, these older people made great sacrifices for the society and younger generations, but continually emphasizing and promoting these examples could normalize these behaviors, making "sacrifice for younger people" a moral obligation of old age. The society was less sensitive toward the death of the elderly. There is a high mortality rate of older adults during the pandemic, but people tended to be more acceptable about these facts, seeing them as "inevitable" effect of the pandemic [19].

Systemic discrimination and prejudice are not the problem faced only by older adults. Similar to older adults, people with disabilities are also not favoured by the utilitarian models of distributive justice like QALY, and were perceived as "having life with low quality". Various state in The US has established policies that discriminate against people with intellectual disabilities, and there is a higher risk of these people getting infected and dying from COVID-19 [20]. There is also racial discrimination. As social and health inequalities is a long-lasting problem for the minority groups, people from minority groups have long facing higher risk of getting disease. For this reason, minority people started with worse average health condition in the pandemic. In this case, fewer patients from minority groups get treatment if prioritized treatment is given to those "healthier" patients with the larger possibility of recovering [21].

## 5. Summary

The COVID-19 pandemic has revealed the inadequacy of the global healthcare system in the face of an influx of patients. In the absence of emergent medical resources, there is also lack of a unified, ethical guidance for the allocation of these resources. In this case, the resulting fair allocation dilemma has led to problems such as mental health problems of the healthcare workers and ageism. This paper focuses on the various ethical principles used to guide the allocation of scarce resources in the past and discusses how these principles can be applied during the COVID-19 pandemic. Analyzing and understanding these ethical challenges during the pandemic is meaningful for the research of morality. It helps the researchers to better understand how people make moral decisions during such challenging situations. Also, learning from different influence caused by current policies helps the policy makers prepares for future similar situations. In addition, the literature summarized in this paper has some limitations. For one, the past study was mainly focused on the western developed society. Although some statistics show that the problem of scarce health resources is equally or more serious in many developing countries, there is little discussion about how these countries are dealing with these problems. Also, in the current paper, the relationship between different distribution policies and their impacts is speculative, based on the policy recommendations from studies at the early stage of the pandemic and the social changes happening during the pandemic. There are few studies specifically studied how policies balanced ethical rules in different ways resulting in differences in society. Future research in this field should work to deal with these limitations. To provide a more precise and more comprehensive view of the distribution dilemma, it is important to draw data from all different societies. It would be worth researching how the non-western culture sees the ethics of resource allocation and how they tried to deal with the dilemma of scarce resource distribution. At the same time, more targeted research on the current policies makes the comparison between different

policies easier. And it helps figure out a better way of balancing different ethical principles, as well as the interest of different groups. Also, as there are some social problems in the current policy context, it is crucial to research improving the situation, such as how the existing stigmatization of older adults can be reduced. The COVID-19 pandemic is a large challenge but also an important lesson for the whole world. Hopefully, people can learn from this experience and better handle these problems in future crisis.

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