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Resource allocation during COVID-19 pandemic: an ethical approach

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Resource allocation during covid-19 pandemic: an ethical approach

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Index

Abstract (EN)	4
Resumo (PT)	5
Abbreviations	6
Introduction	7
Methods	9
Discussion	10
Resource allocation in healthcare	10
Guiding principles for resource allocation	11
1) Equity and fairness	11
• <i>Age and frailty as decision criterion</i>	12
• <i>Respect for autonomy</i>	18
• <i>Promoting instrumental value</i>	19
• <i>Withhold and withdrawal treatment. Critical role of Palliative Care.</i>	20
2) Transparency and flexibility	22
Who should make these decisions?	24
Conclusion	25
Acknowledgements	31
References	32

Abstract

Introduction: The World Health Organization declared the COVID-19 infection to be a pandemic on March 11, 2020. Since then, this situation has brought dramatic worldwide consequences affecting social, economic and health systems.

Many infected patients require respiratory support and prolonged hospitalization in intensive care units. Therefore, considering that the number of these patients far exceeded the available resources, healthcare professionals had to face challenging decisions related to who should benefit from the limited resources and who should not.

In this context, it is of paramount importance that we reflect on some criteria adopted to guide these decisions to determine if they can be considered morally acceptable or not, based on the best ethical standards.

Methods: This narrative review is the result of a scientific literature research using the PubMed database. Scientific books, international and national resource allocation and intensive care management guidelines were also consulted.

Results: The ethical reflection about criteria adopted to guide decision-making processes, such as the use of age and frailty, was emphasised. Some topics were also highlighted, for instance, the development of advance directives, the importance of an early introduction of palliative care, the role of social media in public communication of allocation decisions and the creation of triage committees.

Conclusion: It is crucial to reflect on criteria guiding allocation decisions, to promote their divulgation and ethical discussion. Ideally, these strategies should be established and integrated into institutional policies before a crisis scenario, to anticipate a potential new public health emergency and prevent possible tragic consequences.

Keywords: SARS-CoV-2, COVID-19, Pandemics, Allocation of Resources, Ethics

Resumo

Introdução: A Organização Mundial de Saúde considerou a infecção por COVID-19 como sendo uma pandemia a 11 de março de 2020 e desde aí, têm-se vivenciado consequências dramáticas a nível social, económico e dos sistemas de saúde.

Muitos dos pacientes infetados necessitam de suporte ventilatório e hospitalizações prolongadas em unidades de cuidados intensivos. Assim, considerando que o número de pacientes críticos ultrapassa consideravelmente o número de recursos hospitalares disponíveis, os profissionais de saúde depararam-se com decisões difíceis, nomeadamente determinar quais os pacientes que deveriam beneficiar destes recursos escassos.

Neste contexto, é fundamental uma reflexão acerca dos critérios orientadores destas decisões, avaliando se são moralmente aceitáveis ou não, de acordo com os princípios éticos.

Métodos: Esta revisão da literatura é o resultado de uma pesquisa científica utilizando a base de dados PubMed. Para além disso, foram também consultados livros de texto e *guidelines* nacionais e internacionais relativas à alocação de recursos e abordagem do paciente no contexto de cuidados intensivos.

Resultados: É abordada uma reflexão ética sobre os critérios orientadores nas decisões de alocação, nomeadamente, o uso da idade e fragilidade como critério. Alguns tópicos também foram destacados, por exemplo, o desenvolvimento de diretivas antecipadas de vontade, a importância da introdução precoce dos cuidados paliativos, o papel dos *media* na comunicação pública de decisões de alocação e a criação de comitês de triagem.

Conclusão: É crucial uma reflexão acerca dos princípios orientadores das decisões de alocação, de forma a promover a sua divulgação e discussão ética. Idealmente, estas decisões devem ser estabelecidas e integradas nas políticas institucionais antes de um cenário de crise, de forma a antecipar uma potencial nova emergência de saúde pública e diminuir possíveis consequências trágicas.

Palavras-chave: SARS-CoV-2, Covid-19, Pandemias, Alocação De Recursos, Ética

Abbreviations:

ADLs: Activities of Daily Living

CFS: Clinical Frailty Scale

DNR: Do Not Resuscitate

ECMO: Extracorporeal Membrane Oxygenation

ICU: Intensive Care Units

MELD: Model for End-Stage Liver Disease

NICE: National Institute for Health and Care Excellence

SARS: Severe Acute Respiratory Syndrome

SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2

SEMICYUC: Spanish Society of Intensive Care Medicine and Coronary Units

SIAARTI: Italian College of Anesthesia, Analgesia, Resuscitation, and Intensive Care

SOFA: Sequential Organ Failure Assessment

Introduction

For the past year, we have been witnessing a global health emergency, due to a novel coronavirus, the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2).

The first cases were reported in December of 2019, in Wuhan, Hubei Province, China. However, this zoonotic disease with evidence of person-to-person transmission rapidly took pandemic proportions, affecting all continents and over 100 countries in just a few weeks.¹ On March 11th, the World Health Organization declared it to be a pandemic and it reached one million infected worldwide in the first week of April.^{1,2}

This health crisis has confirmed that known ethical issues related to infectious disease management remain, despite considerable efforts to recognize and mitigate them in past outbreaks, like Ebola, Severe Acute Respiratory Syndrome (SARS) and H1N1 influenza.³

Indeed, many questions arise: Should the contact between an intensivist and their family be restrained? Should patients hospitalized with a terminal illness be prohibited to see their loved ones? Can we preserve health professionals' "obligation to treat" in a pandemic scenario, where doing so poses a high risk of harm to them? How should hospitals allocate scarce resources?⁴ These questions reflect some ethical dilemmas that COVID-19 pandemic brought, beyond the already challenging mission to provide adequate health care to every patient in need (not only those infected with COVID-19).

A large-scale study from China indicates that approximately 80% of the population infected will show mild or no symptoms. Of the infected patients, 15% will have severe symptoms, requiring hospitalization and 5% will present critical illness, due to an interstitial pneumonia that can exacerbate rapidly into acute hypoxemic respiratory failure and acute respiratory distress syndrome⁵, therefore requiring admission in Intensive Care Units (ICU) and ventilatory support that may be needed for weeks.⁶⁻⁸

In countries such as Italy, the influx of infected patients presenting life-threatening disease was disproportional to the available resources, which resulted in healthcare professionals need to make difficult decisions, such as choosing who is provided ventilatory support and who is not, facing the terrifying decision on whose life to save.

Are doctors prepared to make these decisions? Should they take this responsibility alone?

Decision-making processes based on equipment availability, rather than centred on specific patients' best interests is an unprecedented scenario for many, particularly in developed countries, and has significant ethical implications.⁵

Various guidelines were developed, and general algorithms were proposed to uniformize criteria of healthcare admission, avoiding the “first-come, first-served” approach but also to help healthcare providers when dealing with individual patients, as these complex decisions may be ethically and emotionally demanding.^{9,10}

Some reviews tried to adapt the previous resource allocation guidelines, for example, the “Pandemic Influenza Plan”, proposed in 2005 and updated in 2017. However, the H1N1 pandemic was considered moderated, in what concerns reproductive number, patients presenting critical symptoms and even mortality rate, compared to the one we are now facing.⁶

In fact, Ezekiel, et al., mentioned that mortality rate from Covid-19 ranges between 0,25% to 3%. This number is much higher compared to the mortality of seasonal influenza, which is around 0,1%.⁶

Also, reports suggest that elderly and patients with previously associated comorbidities are excessively affected in both morbidity and mortality. According to the Centers for Disease Control and Prevention, 80% of documented deaths were among patients over 65 years old.^{11,12}

With that being said and considering that the numbers of new infected patients are rising, it is believed that the previous models aren't sufficient in managing ICU beds, ventilators, respiratory therapists and trained intensivists availability this time.⁶ Besides, even if public health mitigation efforts can reduce the incidence of new cases, they do not prevent the need to ethically and consistently prepare for the allocation of scarce medical resources, before it becomes required, whether that be in this or other public health emergencies.⁶

In this review, we will analyse resource allocation strategies proposed in the first wave of this pandemic, focusing on ethical principles, and evaluate how these principles justify or condemn those approaches.

Methods

This narrative review is the result of a scientific literature research using PubMed database, to identify published articles about ethical dilemmas related to the covid-19 pandemic, more precisely the problem of scarce resources allocation in the healthcare setting.

The MeSH terms applied were: “sars cov 2”, “covid 19”, “pandemics”, “allocation of resources”, “ethics”, “ethical directives” and “health resources”.

The articles selected were published between December of 2019 and September of 2020. Also, only free full-text articles written in English, Portuguese and Spanish were included.

According to the research strategy previously explained, 158 references were obtained. Subsequently, 67 articles were excluded based on a careful reading of all the abstracts. Of the remaining 91 articles, 44 fulfilled the inclusion criteria and were cited in this review.

Other information sources were used, such as international and national resource allocation and intensive care management guidelines, and two textbooks: “Principles of Biomedical Ethics”¹³ and “Encyclopedia of Bioethics”.¹⁴

Citations and references follow “Acta Médica Portuguesa” recommendations and are presented according to the Vancouver referencing style.

Discussion

Resource allocation in healthcare

Resource allocations strategies in healthcare can be categorized in macroallocation and microallocation.

Macroallocation comprehends the distribution of resources that are assigned to healthcare services. It determines how the budget fixed by the government regarding healthcare should be distributed; for example: should we invest in expanding ICU beds capacity? How much should be assigned to treat chronic diseases prevailing in our population, such as diabetes?^{12,13}

Nevertheless, in this paper we will focus on microallocation, which establishes which patients, among those who need a specific resource, should have priority over it.^{12,13} Regarding healthcare, prioritising access to a potential lifesaving treatment, in the context of limited resources, is considered rationing. Inevitably, when the demand exceeds the supply, some patients will be left without it.^{1,15}

One practical example is organ transplantation. Organ transplantation programmes are potentially life-saving procedures, on which prioritization lists and triage protocols are used because the number of organs and compatible donors available are disproportionately lower comparing to the patients needing it. These protocols are broadly accepted by society, perhaps because they focus mostly on transparent, explicit clinical inclusion and exclusion criteria, like Model for End-Stage Liver Disease (MELD) and Lille scores to access prognosis in liver transplantation, but also, because they comprehend the evaluation of the candidate by committees detached from the patient-primary care team and presume national cooperation and communication between healthcare centres.^{16,17}

In fact, the coordination between hospitals is crucial when dealing with scarce resources allocation, and almost every guideline insists that the first measure, should be trying to expand the available resources.^{8,10,18}

Concerning the COVID-19 pandemic, this can be done either by increasing the number of ICU beds and ventilators or by guaranteeing inter-hospitals patients mobility.¹⁶

However, in many countries, the influx of patients was so overwhelming compared to the available resources, and this happened in such a short time frame, that transferring patients between hospitals or expanding ICU capacity by transforming post-anaesthesia care units and operation rooms into intensive care provisory units was not sufficient and sometimes not even possible.¹⁹ Additionally, this may also lead to other problems.

First of all, the care provided in these provisory units may be suboptimal, as they might not have sufficient trained clinicians and a variety of technological equipment existing in the ICU, like Extracorporeal Membrane Oxygenation (ECMO).²⁰ Secondly, as health resources and professionals are being mobilized to provide acute care, many elective surgeries and consultations are being postponed and this can result in the worsening of many other health conditions, beyond Covid-19.²¹

In addition to time and facilities constraints, human resources have also become scarce, as healthcare workers got sick and many of them died, as a consequence of this infection^{9,15}

Therefore, some hospitals had to prioritize patients access to ICU. That does not imply that one life is more valuable than another, it only suggests that in the context of scarce resources, we need to allocate them in the most effective way. Also, this situation escalated so quickly that rapid decisions were unavoidable.^{1,12,22}

At this point, when the request for life-saving treatments fairly exceeds the available resources, what criteria should guide rationing decisions?²³

Guiding principles for resource allocation

1) Equity and fairness

Distributive justice can be interpreted as fair, equitable, and proper distribution of benefits and burdens, established by rules that structure the terms of public cooperation.¹³ This principle assumes paramount importance in this context, just as it does in everyday clinical practice. However, during this pandemic scenario, the focus is not only on the beneficence of individual patients, but mainly in the benefits of society as a whole.^{18,24}

This could be understood as “doing the greatest good, for the greatest number”, which means, focusing on maximising the number of lives saved.²⁴

According to utilitarianism, a consequentialist theory that focuses on the outcomes of actions, the best action is the one that leads to maximum happiness, defined by John Stuart Mill as “pleasure and the absence of pain”. Following this theory, patients whose health and well-being contribute most to society’s happiness should be prioritized in healthcare resources access. This would lead to individual judgements of social worth.²⁵

In contrast, for the deontological theory Egalitarianism, the act itself is more important than the outcome, and the morality of the act is determined by an accepted set of norms. According to this theory, all individuals are equals and have the same social value.²⁵

No single theory of justice can capture all ethically relevant principles and the complexity inherent to resource allocation decisions,^{23,25} so multiple criteria were proposed to achieve this goal and some of them are described in this chapter.

- *Age and frailty as decision criterion*

The first specific COVID-19 resource allocation strategy was developed in Italy, the earliest European country where the number of infected patients far exceed available resources, by the Italian College of Anesthesia, Analgesia, Resuscitation, and Intensive Care (SIAARTI).^{26,27}

Although not only based on patients' chronological age, they advocated an age cut-off for ICU admission, if eventually needed. They argue that resources should be given to those who have a higher probability of survival and life expectancy, to maximize the benefits for the largest number of patients.⁸

This was also suggested by other entities, such as the Spanish Society of Intensive Care Medicine and Coronary Units (SEMICYUC) and the Swiss Academy of Medical Sciences.^{12,28}

This approach has been criticized and considered "ageist", as it propagates the erroneous idea that age and frailty are equivalent.

In fact, ageing is a heterogeneous process and does not always correlate with polymorbidity. Additionally, in these decisions, it is more important to consider how long one patient is expected to live, rather than for how long he has been alive; and life expectancy cannot be determined exclusively based on chronological age.¹² The literature demonstrates that although age is a factor in predicting mortality, other factors including functional trajectory, multimorbidity and frailty are more predictive.^{11,19}

In contrast to these recommendations, the National Institute for Health and Care Excellence (NICE) in the United Kingdom proposed a distinct approach when challenged with the scarcity of resources.

In their *COVID-19 Rapid Guideline: Critical Care*, instead of focusing on the patients' age, they evaluate patients' frailty. In fact, frailty represents a physiological decline across one or

more systems and therefore it is correlated to susceptibility to aggressions, like an infection. Consequently, a frailer patient will have more comorbidities and a worst prognosis.^{29,30}

In theory, frailty often correlates with older age, as elderly people usually present more comorbidities that leave them more susceptible to stressful events. However, young people can also present with frailty, while some elder people are healthier compared to younger ones.

There are several procedures that can be used to assess frailty. In this context, it is important to use an objective, structured, reproducible and evidence-based validated method.

Furthermore, it should be a simple and practical tool to use in the emergency department, as these decisions can be even harder to make considering possible barriers when it comes to communication, insufficient time for careful decision-making and, in most cases, lack of knowledge about the patients' data.¹⁹

One tool that has been commonly used in both actual and previous pandemics is the Sequential Organ Failure Assessment (SOFA) score.¹¹ It does not incorporate the patients' age and it is objective, because it relies on laboratory values like serum creatinine, platelet count and bilirubin, and considers blood and oxygen pressure levels as well as the score on the Glasgow scale. This allows accessing to the general respiratory, cardiovascular, hepatic, coagulation, renal and neurological systems' function.^{19,31}

While waiting for the laboratory values, clinicians can assess frailty using the 9-point Clinical Frailty Scale (CFS), as suggested by NICE guidelines.¹⁹ This easy-to-use screening tool developed by the Canadian geriatrician Kenneth Rockwood, categorizes patients from 1 (very fit) to 9 (terminally ill), after the evaluation by experienced clinicians.³⁰

Based on a careful clinical history, focusing on items such as mobility, balance and autonomy for Activities of Daily Living (ADLs) two weeks before the onset of symptoms, they estimate the patient's level of frailty or robustness, as described in the table below (table 1).³²

Clinical Frailty Scale		
Score	Meaning	Description
1	Very fit	People who are active and tend to exercise frequently. They are among the fittest for their age.
2	Fit	People who are asymptomatic and do not have active disease. However, they are less fit than category 1.
3	Managing well	People whose medical problems are well controlled, although they can be occasionally symptomatic.
4	Very mild frailty	People independent for many daily activities. However, symptoms can often limit activities.
5	Mild frailty	People that need help with high order instrumental activities (finances, transportation). Progressively impairment for walking outside alone, meal preparation and medication adherence.
6	Moderate frailty	People that need help with all activities outside and with housekeeping. They sometimes need help with personal care.
7	Severe frailty	People completely dependent for personal care, but who are stable and not at great risk of dying within 6 months.
8	Very severe frailty	People completely dependent on personal care and approaching end of life. In most cases, they could not recover from a minor illness.
9	Terminally ill	People whose life expectancy is <6 months and who are not otherwise living with severe frailty (some can still be independent and even exercise).

Table 1: Clinical Frailty Scale ³²

This scale is a predictor for in-hospital mortality independently of age and seems practical to use in the context of an overwhelmed hospital due to this pandemic. Its use is also recommended by other institutions, such as Canadian Geriatrics Society and German Society of Intensive Care.^{29,33}

The goal is to determine the person's baseline health status and predict adverse health outcomes in a variety of settings, including acute care. ³²

This is especially important in clinical settings where health status can change rapidly. For example, many old patients, when admitted to the hospital, may appear to be frail due to the acute illness but were fit and autonomous in the previous weeks. ³²

CFS has been updated in 2020 and it is worth noticing that is not suitable for evaluating younger people (< 65 years old) or those with stable single-system disabilities, such as autism or other intellectual disabilities.³²

NICE guidelines advocate that scoring ≥ 5 points in CFS is considered a worst prognostic factor and therefore, these patients may not be admitted to ICU, in the context of scarce resources.²⁹ They proposed the following algorithm to support decision-making (Fig.1).²²

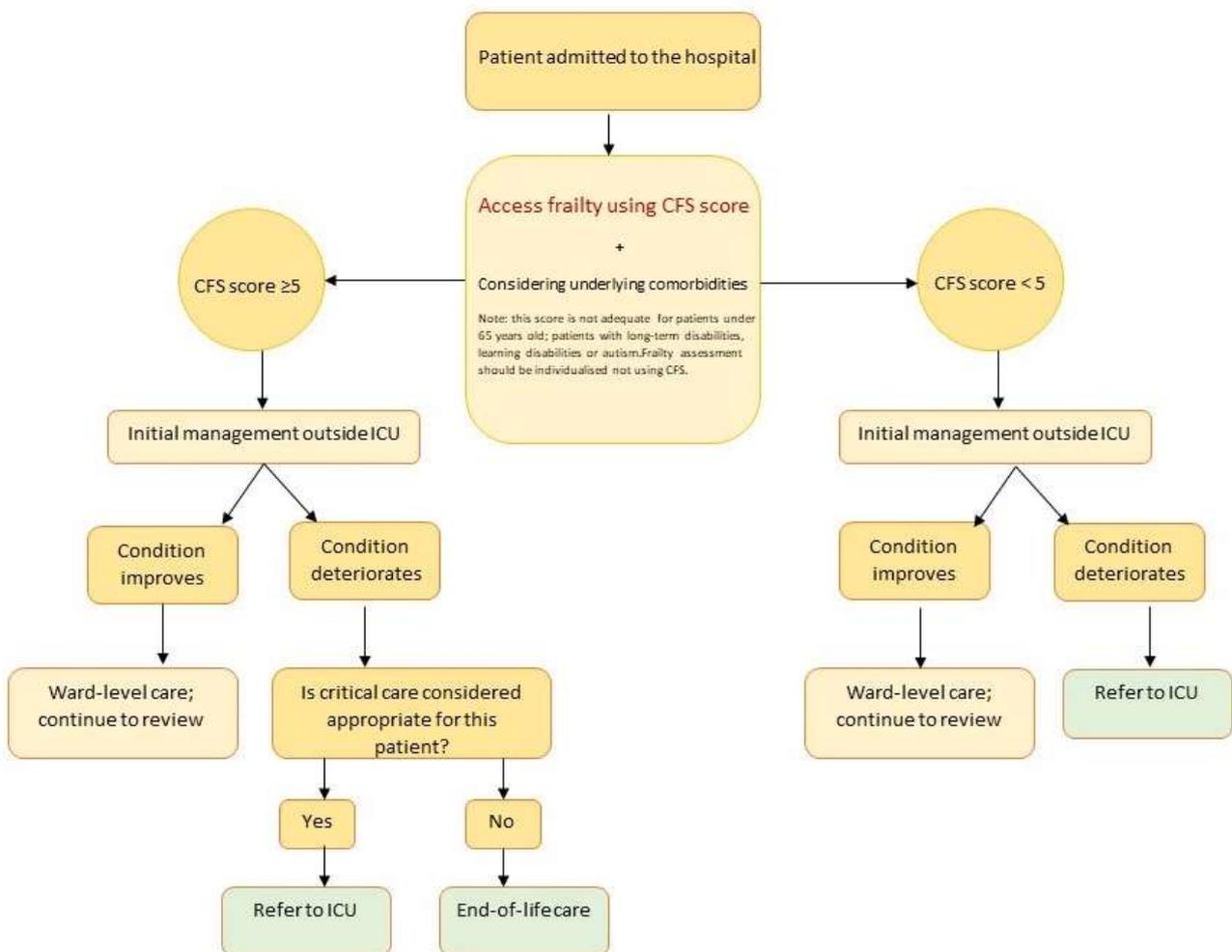


Figure 1: Algorithm for patient management (NICE guidelines)^{26,22}

According to a study developed in Canada, involving 1200 older adults where CFS was used to assess frailty, the risk of mortality raises as frailty severity increases.²⁹

Although CFS allows identifying which patients will most likely benefit and respond to treatment, this study also demonstrated that older adults that scored 5 points or higher (mild frailty (5) – terminally ill (9)), still have a considerable one-year survival rate of approximately 50%. Therefore, this addresses the need of considering other factors besides frailty, such as the severity of the acute illness when assessing patients' prognosis.^{29,32}

In fact, SIAARTI, NICE and other European guidelines consider prognosis evaluation as an indispensable precondition for maximizing benefit.²⁸ However, they differ in the importance they give to short-term or long-term survival, in assessing prognosis.

On one hand, the Swiss Academy of Medical Sciences and the Austrian Society for Anaesthesiology, Reanimation and Intensive Care suggest that clinicians should only focus on short-term survival. On the other hand, Italian and German guidelines suggest the possibility that long-term survival or a reduced life-span, due to older age or to comorbidities, could play a role in triage decisions.²⁸

Some frameworks argue that “number of life-years saved” is an expression of overall survival and that the moral intuition of many people would lead them to prioritize a patient who is still expected to live for 30 years rather than one with a chronic illness that will, most likely, result in death within a few years.²³ However, this leads to the ethical concern that using the “number of life-years saved” criterion, although not referencing age directly, patients' age will still be an implied criterion, predictably disfavoring older people relative to younger ones.^{11,24}

As stated before, even though age plays an undeniable role in predicting life expectancy, it is not the only variable, as two persons of the same age can have heterogeneous health status and trajectories.¹¹

In contrast, other frameworks defend focusing on short-term outcomes, by assessing in-hospital survival and comorbidities which contribute to short-term mortality (<6 months).²⁷ In fact, considering near-term survival can be justified, because even if a patient survives after the hospitalization episode for COVID-19, the short-term benefit will be limited, given the previous comorbidities. In addition, this requires an individual assessment of the patient.¹¹

Another approach regarding allocation decisions is considering “life-years lived”. This includes the so-called “fair innings” argument, that suggests that people who have not gone through the various stages of life, like childhood, adolescence, adulthood and old age, should be prioritized over those who already have.^{11,23}

According to this argument, younger individuals are not more worthy or valuable, but they have not had an equal opportunity to live through all the different life stages. In theory, older adults have had more chance to experience the good things in life: maybe they had families and enjoyed fulfilling careers, and perhaps even reached retirement and became grandparents, something that children, and even young adults, haven't experienced yet.^{11,23}

Nevertheless, this approach can be criticized on the basis that ageing is a dynamic process and includes positive features at every stage of life. Also, older people may not have had the advantages that others had at earlier stages in life. Maybe older adults have just begun to appreciate the social and emotional aspects of being alive. Besides, it is worth noting that it is extremely hard to determine if a person has had more goods in life than others, or not, and this can lead to biased and value-laden judgments.¹¹

Even though using frailty as a decision marker for ICU care will most likely continue to prioritize access to intensive care to younger patients, it does not reduce this choice to a parameter that can be as heterogeneous as chronological age. Instead, it sees all patients as equals regardless of the age and prioritizes those who have a possible better outcome.

Beauchamp and Childress suggest the prospect of therapeutic success as an important criterion; patients who have higher chances of improving their condition should be prioritized over those in which the treatment may be futile.¹¹

However, decisions based on medical futility are ethically different from those solely based on age.²⁹ Categorical exclusions based on age and prioritizing automatically younger patients over older ones, disproportionately disfavours older adults and perpetuates injustice by stereotyping the elderly, leading to persistent beliefs that their lives are less valuable or expendable.^{10,11,13,27}

Every individual has the same dignity, the same moral value, and the right to be offered equal access to healthcare.^{1,34}

However, as described before, when therapeutic capacity is exhausted, admitting every patient to ICU is merely not possible, and prioritization must take place.²⁷ According to the utilitarian theory of justice, the goal in this context is to save as many lives as possible. Nevertheless, this principle must always be aligned with the principle of equity, that implies that the distribution of resources should be fair.³⁴

The World Medical Association's Declaration on the Rights of the Patient (1981) affirms: "In circumstances where a choice must be made between potential patients for a particular treatment that is in limited supply, all such patients are entitled to a fair selection procedure for that treatment. That choice must be based on medical criteria and made without discrimination".¹²

Therefore, prioritization in access to health care should never be based on wealth, gender, social status or chronological age. Only clinically relevant criteria, such as the severity of the current disease, previous comorbidities and potential for recovery should weight in these triage decisions.^{10,29,34}

Also, to guarantee equity and fairness, these criteria should be applied to every patient requiring intensive care. We must ensure that vulnerable patients and patients with disabilities have an equal opportunity to benefit from treatment.²⁷ In addition, patients infected with SARS-CoV-2 must not be prioritized over those presenting other illnesses.

- *Respect for autonomy*

According to Beauchamp and Childress, the patients' autonomous decisions should be respected. They argue that autonomy implies an individual acting intentionally, with appropriate information and knowledge and without external influences like coercion, manipulation or internal states such as a mental illness, that could determine their course of action.¹³

Patients can manifest their wishes directly or through an advance directive. Although these conversations can be challenging, patients should be encouraged to be more active in clinical decisions, by expressing what matters most to them, their expectations and goals of care.^{27,29,35} Additionally, they should be recommended to designate a surrogate for healthcare decision-making, on the occasion they lose the capacity to make decisions for themselves.²¹

In fact, SIAARTI's guidelines also refer to the importance of evaluating the existence of advance healthcare directives, especially for patients with multiple comorbidities.⁸

These documents have a critical role in healthcare emergencies, as they identify patients who do not wish to receive certain treatments, such as life-saving and life-prolonging treatments (like intubation and mechanical ventilation support) and therefore reduce the need to ration limited resources.²⁷ This also allows a decrease on the burden of healthcare professionals who have to make allocation decisions and respect patients' autonomy, by providing goal-concordant care.^{21,27}

Advance care planning discussions should take place before a crisis scenario to ensure that these choices are not rationing or allocation decisions, and to guarantee that patients' wishes are not coerced by the emergency context.²⁷

However, it should be reminded that clinicians should not infer that having advance care discussions means a clear preference for limited therapeutic interventions. Clinicians should still question about the patients' wishes and must not infer that a Do Not Resuscitate (DNR) order is the same as refusing other treatments, whether curative or palliative.¹¹

Although the patients' autonomy should always be acknowledged, and in most cases, respected,¹² during these atypical circumstances, this ethical obligation may be overridden by public health policies that focus on the benefit for the greatest number of people.^{23,29}

In fact, Beauchamp and Childress advocate that autonomy should not be excessively individualist, which means that we should consider the patient as a social individual and be aware of the impact that an individual choice can have on others.¹¹

The principle of respect for autonomy needs specification in particular contexts and may incorporate valid exceptions. If an autonomous choice endangers public health, potentially harm innocent lives, or require a scarce resource, others can justifiably restrict the exercise of autonomy.¹¹

- *Promoting instrumental value*

It was previously mentioned that triage decisions should not be based on morally irrelevant, non-medical criteria such as gender, wealth, social connections, religion, or social status.

However, many frameworks suggest an exception to this rule: individuals who can save a large number of human lives, such as healthcare professionals and first responders, should be given higher priority.^{23,34} This does not mean that their lives are more worthy or valuable than other individuals, but they have instrumental value, that allows to maximize benefits, by saving other lives.²³ If healthcare workers are incapacitated, all patients (not only those with Covid-19), will suffer greater mortality.⁶

Also, it must be considered that intensive care therapies are heavily dependent on trained staff, that cannot easily be replaced. In this scenario, the utilitarian argument is that a pandemic is an extraordinary situation which allows the pursuit of the biggest common benefit.³⁴ Beauchamp and Childress argue that it is legitimate to give treatment priority to certain individuals if their contribution is fundamental to achieving a major social goal, based on social utility.¹³

Others agree that healthcare workers must be prioritized, not only because of their instrumental value but also as a matter of reciprocity, for their personal sacrifice by voluntarily

and altruistically accepting responsibilities that place them at a raised personal risk, including the possibility of illness or even death.³⁶

However, when using social utility as criteria, we should limit our judgments to the specific characteristics and skills that are essential to the public's immediate protection, without considering the general social worth of persons.¹³ Priority given to critical workers must not be misemployed by prioritizing wealthy or famous persons.⁶

- *Withhold and withdrawal treatment. Critical role of Palliative Care*

Another ethical dilemma healthcare workers are facing during this pandemic is whether withholding (not starting) or withdrawing (stopping) a potentially life-saving treatment is morally acceptable or not.

According to the principle of beneficence, there is no ethical noteworthy difference between withholding and withdrawing life-sustaining treatments if they are considered futile, no longer clinically indicated, or against the patients' best interests. It is, in fact, the medically appropriate decision, regardless of resource scarcity, in cases when the interventions are deemed futile.^{15,28,34,37}

In contrast, in the context of scarce medical resources, withdrawing treatment of a patient who has some chance of surviving, in order to treat another who may have a greater chance, is ethically debatable.¹² However, from a psychological point of view, it is easier for both families and healthcare workers to decide not to start treatment rather than to discontinue it.¹² The latter can be felt as a momentaneous and consequential decision that may lead to a patient's death, whereas not starting treatment does not seem to have the same causal effect.¹³

This highlights the importance of advance care planning discussions and the need to develop decision-making algorithms.^{12,34}

Moreover, in this pandemic scenario, considering the goal of maximizing population outcomes, it is not sustainable that patients unlikely to survive use scarce resources, such as ventilators, indefinitely.²³

Therefore, SIAARTI's guidelines suggest that every ICU admission should be considered an "ICU trial".⁸ In fact, in some cases, it is only possible to evaluate prognosis and balance prospective benefits and burdens after starting the treatment.¹³ This trial period will allow reducing uncertainty about outcomes, by periodically re-evaluating the appropriateness of treatments, patient's clinical course, wishes, expected goals and proportionality of ICU care.^{8,13}

The duration of these trials should be defined as early as possible and according to the available data about the natural history of the disease but it can always be submitted to modifications, if subsequent emerging data suggest the trial duration should be shortened or prolonged.¹⁸

Thus, if a patient is not responding to treatment or several complications arise, a decision to withhold or withdraw further or ongoing therapies should be made.^{8,35} Reallocation decisions are exceptionally challenging, but ethically justifiable, if the chance of benefit from continuous use is low.²¹

Some strategies can help in those extremely hard decisions. Firstly, when admitting a patient to ICU, it should be explained to the patient, if conscious and in full possession of their mental faculties, and/or to their family or surrogate, that mechanical ventilation should be considered a time-limited therapeutic trial, to appropriately set expectations.²³

Although considered a trial, the duration of these treatments must not be too brief to prevent premature withdrawing of ventilators from patients who, if treated for some more days, would have survived.^{8,23} In addition, it must be noted that decisions to withhold invasive treatments do not imply that other non-invasive treatments should also be withheld.⁸ Patients can be transferred to an intermediate care unit, equipped with high oxygen flow devices, after a premature extubation in the ICU.⁹

Furthermore, these decisions should always be discussed among healthcare providers, explained to the patient's family or surrogates, and well documented.⁸

An early introduction of palliative care is of paramount importance at this point. For those patients who are severely ill but non-eligible for high-intensity invasive treatments, or those unlikely to benefit from critical care despite maximal intensive care support, optimal, compassionate and respectful palliative care should be provided.^{8,12,27}

The goal should be, as stated by the World Health Organization, the relief of physical, psychosocial, and spiritual distress, respecting patients' wishes and their relatives' needs.¹⁴

Symptoms associated with COVID-19 pneumonia, like, pain, delirium, dyspnoea and other respiratory symptoms should be alleviated using pharmacological or non-pharmacological methods, in close collaboration with other medical care specialists.³⁸

Providing comfort at the end of a patient's life might be increasingly challenging as some of them may still require isolation measures. Those measures can imply restricted access to their families and other personnel that may be classified in the healthcare environment as low priority or non-essential to the immediate survival of the patient, disregarding the importance and the impact of the psychosocial dimension in the well-being of the patients admitted to the healthcare services.

Also, relatives frequently experience feelings of worry, guilt, and helplessness. Families should be allowed to be present during the patients' final moments, preferably in person, using personal protective equipment or, if that is not possible, through videoconferencing.^{23,38,39}

In addition, palliative care experts should be included in intensive care teams and psychological and spiritual support must be granted to patients who are allocated ICU beds, as well as to those who are not, to their relatives and to healthcare workers as they have to make hard decisions that lead to moral and emotional distress.^{9,38}

2) Transparency and flexibility

Decisions about scarce resources allocation are more likely to be accepted by society, clinical teams and institutions when the decision-making process is fair. The characteristics of a fair decision-making process include being open about decisions, by clearly explaining the reasons behind them, giving visibility to the legal and ethical accountability regarding them.^{27,40}

In fact, some decisions previously described such as prioritizing access to ICU or vaccination to healthcare workers may not be well understood by society at first. This can lead to the undermining of public trust in the healthcare system and in any further measures that might need to be instituted by the governments.³⁴

Public communication and clarification assumes a critical role in fighting the panic and the misinformation associated with this pandemic and will promote society's adherence to measures aiming to prevent virus transmission.⁴¹

Social media has a paramount role in spreading information. During the early days of this pandemic, we saw how media can ease the distribution of unchecked or untruthful facts and news which in several cases led to panic accumulation of essential resources, distrust in the governmental bodies and in healthcare systems or the blatant disregard of the seriousness of the problem we are facing. Nevertheless, it is also thanks to the media that it is possible to spread useful information, such as instructions on how to handle suspected cases of infection and how the healthcare system is managing patients' admission decisions.

These decisions must follow the best ethical standards, be inclusive, reasonable and evidence-based.³⁸ Therefore, they should be periodically reviewed and modified according to the new scientific findings, as the pandemic progresses.³⁴ Ideally, resource allocation strategies should be established and integrated into institutional policies when an organization is not in crisis.²⁷

Moreover, during this pandemic, when scientific information is emerging rapidly, policies and guidelines should come from a centralized source for direct information to healthcare providers.²⁷ Resources availability must be closely monitored, readily and appropriately communicated to clinicians, so that rationing decisions are not precociously established, but only when effectively needed.^{38,42}

In fact, SIAARTI's guidelines stress that criteria for ICU admission in these exceptional circumstances must be flexible and locally adapted according to the availability of resources and the possibility for inter-hospital patient transfer.⁸

In addition, there should be periodic reassessments of the patients receiving critical care and reallocation of resources, if and when necessary.⁴⁰ For instance, when a patient who was expected to recover without mechanical ventilation suffers a worsening of their medical condition and a ventilator is indicated, there should be a reassessment of every patient in the ICU. Patients receiving mechanical ventilatory support who are not responding to treatment may have their treatment downgraded to less invasive ventilatory mechanisms earlier than would be expected in normal circumstances, when this resource scarcity context is not a reality.⁴⁰

All changes in the ICU admission policies should be communicated to the patients and/or their families, explaining the exceptional nature of these measures, as a matter of duty of transparency and to preserve trust in the health service.¹⁰

Preferably, they should be discussed with members of society, particularly with groups that will probably be affected by those decisions, to ensure transparency in these processes.^{34,40} However, we must keep in mind that this is not always possible, especially in a pandemic scenario, where many decisions must be made quickly, due to the rapidly changing circumstances.⁴⁰

We emphasize that these decisions must be transparent, appropriately shared between clinicians, and applied to every patient in need of ICU admission, whether they be Covid-19 infected patients or not.⁸

Who should make these decisions?

Almost every framework agrees that physicians responsible for direct patient care should not be the ones in charge of prioritization or rationing decisions. These decisions are extremely hard, emotionally demanding and will increase the burden of these professionals, that already have the challenging mission to provide the best care to these patients.¹²

Therefore, it is suggested the creation of triage committees. A team that should include an acute care physician triage officer, supported by an ethicist, an expert in palliative medicine, a nurse experienced in intensive therapy and an administrator, who will gather all the information and documentation about patients priority levels and resource availability status and share it with the team.³⁸ These teams should not be providing direct medical care and should be blinded to patients' characteristics associated with inherent bias, such as race or social status.²¹

The triage officer should be a physician with established experience in dealing with critically ill patients (critical care or emergency medicine clinician), with effective leadership, communication, and decision-making skills. This clinician is in charge of supervising the triage process, conduct periodic reassessments of the patients receiving critical care and assigning a level of priority for each one of them. According to the patients' response to treatment, and following ethical principles, this clinician is responsible to make reallocation decisions, if needed.¹⁸ It is fundamental a continuous communication between the triage officer and the treating physicians.

The goal of the triage team is to help the triage office in the decision-making process and collaborate with the primary care physician to disclose triage decisions to patients and their families.¹⁸ They can elaborate a triage protocol to be followed in the decision-making process, that should be regularly reviewed and adapted to the existing evidence of the disease and its treatment.¹²

The creation of these committees is intended to decrease the moral distress of the clinicians that are providing direct treatment, increase objectivity in resource allocation decisions and avoid conflicts between commitments.²³ Doctors vow, during the Hippocratic Oath, to act according to the best interests of their patients. Therefore, these decisions that sometimes are not according to individual patient's best interests, but aim to maximize the greatest public good, can lead to moral conflicts that should not be in clinicians' hands. Clinicians should not be accountable for making beside decisions and must be relieved of this pressure by the triage committee.

Conclusion

In the last three decades, medical care has made impressive progress, mainly due to scientific research and technological development. With vaccination, several infectious diseases that previously had a high mortality rate are now extinguished. Nowadays, there are modern imaging diagnostic tests that allow doctors to study the interior of the human body, being minimally invasive towards the patients.

However, the pandemic caused by SARS-CoV-2 is unprecedented in recent human history. It has spread so fast worldwide that the impact on economics, social behaviour, human connections and healthcare provision have been dramatic. Hospitals were overwhelmed with the increasing influx of patients and, in many cases, healthcare professionals had to make terrifying decisions on whose life to save.

Even in countries where the virus arrived later which, in theory, had more time to prepare according to their knowledge of other realities previously reported in different nations, these problems also occurred.

We never thought that an invisible enemy could have so much impact on the way we are allowed to move inside countries or between them. Similarly, it made us change the way we express emotions and deal with our own mental health which, we realize now, are important aspects of life we have taken for granted in the past.

Regarding healthcare, recent generations, particularly in high-income countries, had never imagined that they might not have access to life-saving assistance simply because there are no resources available anymore.

As previously mentioned, the allocation of scarce resources is present in everyday clinical practice, for example, in organ transplantation, where the patients awaiting transplantation far exceeds the number of available organs and compatible donors. However, the uniqueness in this pandemic is the extraordinarily high number of individuals likely to be impacted by the allocation decisions: these affect entire nations, rather than a limited group of people.

Even though the incidence of crises like this pandemic is relatively rare, this makes the issues regarding scarce resources allocation even more challenging, as it is unfamiliar territory.²⁰

The initial step in managing resource allocation should always be trying to expand resources capacity. However, as discussed before, in this outbreak this is merely not possible, as the influx of patients is increasing exponentially and some of the limited resources cannot be funded or immediately replaced, like trained healthcare workers.

Therefore, patients' prioritization is inevitable in these circumstances. The aim is to do it properly, and an adequate implementation of medical ethics assumes high importance in this task. In fact, there are certain values that cannot be neglected, even in this extraordinary scenario, including considering all human lives as having the same value, respecting patient's autonomy, avoiding harm, and not excluding patients based on their social worth, wealth, cognitive capacities or other non-medical irrelevant criteria.

However, during this pandemic scenario, the focus is not only on the beneficence of individual patients, as we were used to, but mainly in the benefits of society as a whole. Maximizing benefits could be understood as "doing the greatest good, for the greatest number", which means, focusing on maximising the number of lives saved.²⁴

The first specific COVID-19 resource allocation guidelines were developed in Italy, by SIAARTI. Although not only based on patients' chronological age, they propose an age cut-off for ICU admission, if eventually needed. This was also suggested by some institutions in other European countries, like Spain and Switzerland.

They argue that resources should be allocated considering those who have a higher probability of survival and life expectancy, to maximize the benefits for the largest number of patients. However, although chronological age has an impact on prognosis, other factors are more predictive.

This approach, where younger patients are automatically prioritized over older ones, perpetuates injustice, leading to persistent beliefs that elderly lives are less valuable and disproportionately disfavours older adults, which is the age group with higher mortality rates due to Covid-19.

When the provision of a ventilator to a patient in respiratory distress might be only based on their birth date, we should be alarmed, as modern medicine may be at danger of having lost the meaning and value of human life.

If we aim to fight this ageistic approach, then more robust criteria than chronological age, but equally easy-to-use in rapid critical decision-making, should be proposed. It should be a parameter that has an impact on prognostic, such as frailty, previous comorbidities or functional status.⁴³

In fact, NICE guidelines suggest assessing the patients' frailty, using the CFS score. Based on a careful clinical history, it helps determine the person's baseline health status and predict adverse health outcomes, independently of age.

Theoretically, frailty increases with age, but this is not always true. Age and frailty are not synonymous, as a younger patient could be more fragile than an older one and therefore have a likely worse outcome.

Although using frailty as a criterion will most likely continue to prioritize access to intensive care to younger patients, it allows the decision-making process to be based on the prospect of therapeutic success, by identifying those who have a possible better prognosis and prioritizing them, and not on a heterogeneous criteria as chronological age can be.¹¹

Several countries' guidelines agree that maximization of benefits based on the prospect of therapeutic success and survival should be in the centre of the decision-making process. However, there is some disagreement as to whether only short-term survival should be considered or if more long-term outcomes should have a place as well.

On one hand, using "long-term predicted life expectancy", "number of life-years saved" criteria or the "fair innings" argument, although not referencing age directly, patients' age will still be an implied criterion, predictably disfavours older people relative to younger ones.

On the other hand, considering near-term survival (< 6 months) can be justified, because even if a patient survives after the hospitalization episode for COVID-19, the short-term benefit will be limited, given the previous comorbidities. We believe this approach is preferable.

Importantly, it should be reminded that other factors besides frailty should be considered, such as the severity of acute illness, when assessing patients' prognosis. Also, to guarantee equity and fairness, these criteria should be applied to every patient requiring intensive care. Patients infected with SARS-CoV-2 must not be prioritized over those presenting other illnesses.

As stated before, in addition to equity and fairness, respect for the patients' autonomous decisions is imperative in this decision-making process.

This outbreak has highlighted the urgent need for adult patients to engage in advance care planning discussions. They should take place before a crisis scenario, to ensure that these choices are not rationing decisions, and to guarantee that they are truly autonomous, and not coerced by the emergency context.

Patients should be encouraged to create individual care plans that describe their medical conditions, regular medications, healthcare providers, as well as advance care directives. They assume paramount importance in achieving ethical care decisions based on the individual's values, preferences, and goals of care. In addition, they reduce the need to ration limited resources, by identifying patients who do not wish to receive certain treatments

and consequently decrease the burden of healthcare professionals who have to make allocation decisions.

Healthcare providers that previously treated the patient are best suited to access parameters like their patient's comorbidities and the likelihood of survival during critical illness, that are helpful in guiding patient's autonomous decisions during these discussions.

However, we must remember that during a worldwide public health emergency, the ethical obligation of respecting patient's autonomy, may be overridden by public health policies that focus on the benefit for the greatest number of people. These decisions must be carefully explained to the public, as they might not be well understood by society at a first instance and can lead to the undermining of public trust in the healthcare system.

Another measure that might not be totally comprehended by society and needs clarification is prioritizing access to healthcare workers. This measure, defended by several frameworks, does not mean that healthcare professionals lives are more worthy or valuable than other individuals but they have instrumental value, that allows maximizing benefits, by saving other lives.²³ If healthcare workers are incapacitated, all patients (not only those with Covid-19), will suffer greater mortality.

In this context, unequal rules may be justified if they contribute to save a larger number of human lives or to a more effective way of containing of the infection.

However, priority given to critical workers must not be misemployed by prioritizing wealthy or famous persons.⁶ Only the specific characteristics and skills that are essential to the public's immediate protection should be considered.

Another idea worth emphasizing is that, even if it is psychologically easier to withhold rather than to withdraw life-sustaining treatments, there is no ethical difference between these actions, as long as the treatment is considered futile, no longer clinically indicated or against the patients' best interests.

Considering the goal of maximizing population outcomes, it is not sustainable that patients unlikely to survive keep on using scarce resources indefinitely. As already proposed by SIAARTI's guidelines, every ICU admission should be considered an "ICU trial".

In this period, the patients' clinical course and the appropriateness of treatments will be periodically re-evaluated. If a patient is not responding to treatment or several complications arise, a decision to withhold or withdraw further or ongoing therapies should be made. These decisions should always be communicated, discussed among healthcare providers, explained to the patients' family or surrogates, and well documented.

Reallocation decisions are exceptionally challenging, but ethically justifiable if the chance of benefit from continuous use is low.²¹ This highlights the importance of advance care planning discussions and the early introduction of palliative care.

Patients who are severely ill but non-eligible for critical care or unlikely to benefit from it should be provided optimal, compassionate and respectful palliative care. The aim is to relieve the physical, psychosocial, and spiritual distress, respecting patients' wishes and their relatives' needs.¹⁴

In this outbreak scenario, providing appropriate palliative care can be even more challenging, as most patients still require isolation measures. All efforts should be made to allow contact between patients and their relatives, by providing them personal protective equipment or, if that is not possible, through videoconferencing.

Besides, palliative care experts should be included in intensive care teams and psychological and spiritual support must be granted to all patients (both those who are allocated ICU beds and those who are not) and to their relatives, as well as to healthcare workers as they have to make hard decisions that lead to moral and emotional distress.

Clinicians providing direct patient care should not have the responsibility to make these prioritization decisions. To decrease the moral distress of those clinicians and to increase objectivity in resource allocation decisions, triage committees and triage offices should be established to implement rationing strategies. They can elaborate a triage protocol to be followed in the decision-making process, that should be regularly reviewed and adapted according to the existing evidence of the disease and its treatment.

In addition, this decision-making process should be transparent, by clearly explaining to the public the reasons behind those decisions, the legal and ethical accountability and responsibility regarding them. Clarification to the public is fundamental to preserve trust in the healthcare system and in the measures proposed by governments intending to decrease virus transmission in the community.

The time constraints in developing allocation frameworks have not permitted a fully participatory approach. However, it is fundamental that from now on, all those concerned (health professionals, citizens and other experts) in these decisions, have an active voice in the decision-making process.

Ideally, these strategies should be the result of public intense and active ethical reflections and should be established and integrated into institutional policies before a crisis scenario, to anticipate a potential new emergency in the closer or more distant future.

Among the losses caused by this pandemic, there are some gains and hopes for a better future. This challenge has highlighted the importance we should give to daily habits that we have taken for granted. People have found new ways to connect and to help each other while adopting measures to promote the common good. It has shown us how worldwide institutions can cooperate, by sharing scientific knowledge and, when possible, scarce resources.

Also, we believe it will promote fundamental ethical discussions that will help to build trust, enhance solidarity, and guide decision-making.

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