



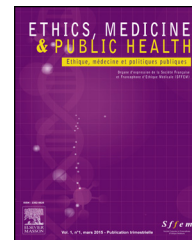
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## REVIEW

# Ethical rationing of healthcare resources during COVID-19 outbreak: Review



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**Summary** While rationing of healthcare resources is inevitable even in the most developed economies, particularly on the wake of a pandemic, ethical basis of its implementation needs to be reviewed. With sudden and huge demand for drugs and medical supplies and equipments, the need for rationing arises and thus the concept becomes unavoidable. Thus, we aimed to review and analyse on the key ethical issues in the concept of healthcare rationing. Our search in various PubMed databases resulted articles explaining on the concept of strategizing the priorities based on universal ethical principles of justice, benevolence and ensuring equality rather than wealth, power, geographical location or other personal biases. Concrete and pragmatic regulations and guidelines for systematic rationing have to be framed and followed. In addition, physicians being sensitive and empowered on deciding bedside rationing in coordination with the recommendations of ethicists and healthcare officials, will ensure fair practice.

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## Introduction

A Pandemic episode of any disease is a sudden potential life-threatening attack that rises alarm for global attention towards healthcare. The history of global public health has faced various episodes of a pandemic of diseases like Influenza, Cholera, SARS, Swine flu and currently, SARS-CoV-2/COVID-19 [1]. The episode of COVID-19 since its early phase of an attack, proves to be a major challenge for global public health regarding its control and prevention.

Any potential life-threatening pandemic demands immediate and complete attention of the entire nation, aside from all the important issues at hand. Health departments at the time of pandemic are bound to make arrangements and frame strategies to contain the spread and handle the situation [2]. The fundamental needs of human-like food, water, clothing, shelter and education stands at stake added with the availability of healthcare resources. This need arises, even in most developed countries which fail to meet the demands every time down history.

The stock, production and supply can never be met by the sudden and sharp increase in demand for specific healthcare resources. Hence, the issue of rationing arises, which further limits the healthcare services [3]. While rationing would be inevitable, the process of how it is implemented has to be considered. The core concepts of autonomy, beneficence and distributive justice have to be in balance.

### What is rationing?

Rationing, by definition, refers to the allocation of resources available with restrictions entailing the withholding of potential beneficiary treatments from some sector of people. This concept enters the radar of healthcare services at the time of epidemic or pandemic attacks [4]. Rationing becomes unavoidable during the time, as the need becomes limitless while resources remain limited. For centuries, physicians have struggled with the controversy of rationing though some deny it while some admit, taking part in the allocation of medical care [5].

However, rationing is not entitled to the medical field, but to other essential needs too like food and water. But the concept is considered in the healthcare field, as it may deny the essential service to some who fight to survive [6]. The modern system of rationing of food or healthcare resources perhaps started with World War – I, when production and supplies became extremely scarce and there is evidence that in India, the rationing system was introduced way ahead during the rule of Allauddin Khilji in the 1390s CE.

In the developed countries, the things rationed may be less, but in developing nations and poor economies, food, water, shelter, clothing, technology and sometimes even education are provided as a priority. Healthcare is no exception. In times of natural calamities or man-made crises rationing is the only way of ensuring the scarce and few resources reach the maximum possible number of people [7]. Hence, rationing is a tool to be considered critical in terms of ethical values.

## Rationing – an inevitable concept

In many industrialized countries, social goods draw funds from a common source—including healthcare, education, defense, infrastructure, environmental protection, and public health. Although the need for such social goods is infinite, the resources available to supply them are limited. Attempting to meet all needs especially healthcare would likely overwhelm our existing system and our capacity to supply basic elements of other social goods, such as public safety, education, and defense. Therefore, some degree of rationing of healthcare is necessary for the overall well-being of society [8].

Rationing in ICUs is a concept practiced daily, where a patient still under a small degree of monitoring will be transferred, to accommodate the need of another sicker patient due to the finite number of beds. Physicians ration their time to balance the needs of the patient and also against their non-professional obligations, like the responsibility of their own families [9].

Thus, in general, when resources are scarce, rationing becomes unavoidable. It is estimated that around 95% of the global population is found to have health problems with nearly two-thirds suffering from more than five ailments, ranging from acute to chronic. Some people are also reported to face ailments that range from mild to severe to life-threatening, requiring routine emergency management and their healthcare requirements like medicines or diagnostic equipment are diversified. However, in regular conditions, this need for a particular drug or apparatus is no challenge while in times of an epidemic outbreak, the scenario completely turns upside down. There occurs a sudden and huge demand for essential drugs and equipment and most importantly, specifically trained healthcare professionals. This need for resources arises the scarcity, which is inevitably followed by rationing.

Even in countries like the United States (US) which spends a bulk of the 17% of its annual GDP on healthcare and countries like India and Indonesia, which share around 3% of their GDP, the concept of rationing is similar and unavoidable [10].

Thus, the study aimed to analyse the rationing concept of healthcare resources during pandemics like COVID-19 and the need for specific ethical guidelines in its implementation.

### Objective

To review the concept of rationing in healthcare resources during a pandemic and analyse the need for country-specific ethical guidelines in its implementation.

### Materials and methods

We searched in various research databases like PubMed and Cochrane for articles reporting the concept of rationing of healthcare resources and its ethical implications.

Our search yielded reviews on the rationing of healthcare resources, its need and its ethical implications that occurred down the history.

**Table 1** Systematic review search strategy.

Database	Number	Keywords used in search
MEDLINE	1	(Ration <sup>a</sup> [tiab]) OR (Ethic <sup>a</sup> [tiab])
(PubMed)	2	(Healthcare <sup>a</sup> [tiab]) OR (Resource <sup>a</sup> [tiab])
	3	(Pandemic[tiab]) OR (COVID[tiab]) OR (Corona[tiab])
	4	#1 AND #2 AND #3
Cochrane	1	(“rational”):ti,ab,kw OR (“ethical”):ti,ab,kw
Library	2	(“healthcare”):ti,ab,kw OR (Resource):ti,ab,kw
	3	(Pandemic):ti,ab,kw OR (COVID):ti,ab,kw OR (Corona):ti,ab,kw
	4	#1 AND #2 AND #3

tiab: title abstract; ti: title; ab: abstract; kw: keyword.  
<sup>a</sup> Wildcard search.

## Search strategy

A search of literature for this systematic review was without any restriction on the date of publication. The initial search was conducted in MEDLINE. The keywords used for specific databases are given in Table 1. A search for the published literature was carried out between December 2020. Thus, the upper limit of publication time for selecting studies for this review was identified as of December 2020.

The search strategy yielded 833 results.

## Inclusion criteria

Studies meeting the following criteria were included in the review:

- published in peer-reviewed journals;
- available in electronic databases;
- conducted in an acute or chronic clinical care setting;
- studies were included if they described either or all of the following variables:
  - level of rationing,
  - aspects of rationing,
  - factors influencing rationing,
  - rationing and its effect on patients or/and nurses/physicians;
- articles available in the English language were only included in the review

## Exclusion criteria

Conference abstracts, books and grey literature were excluded.

## Screening

The search titles were uploaded in Zotero software and scrutinized for duplicates. Firstly, the titles were read and screened as per their relevance to the topic. Secondly, the abstracts of the relevant titles were read by the reviewers (MM and MR) and screened. Thirdly, the full texts of the screened abstracts were read. The screening processes at both abstract and full-text levels were done independently by the reviewers as per the inclusion criteria.

## Data extraction

The data extractions from the screened studies were done in the excel spreadsheet. Details regarding publication, methodology and results were extracted and recoded.

## Search results

Search in the databases revealed 847 titles out of which 141 titles were found relevant to the research objective. Those were exported to Zotero software, which removed 52 duplicates. We limited to articles published since 2000, which resulted in nearly 49 articles (studies and reviews) explaining the healthcare resource allocation during emergency conditions like epidemics and pandemics with some references to COVID-19. Thus, abstracts of 49 studies were read in the second stage, 35 articles were taken for full-text screening, and out of those, 26 studies could be included in the final review. Thus, a total of 26 articles were included for this systematic review that focused on healthcare resource rationing and ethical considerations concerning public health. All articles were published in English. They were then reviewed in detail for the factors to be considered in rationing during pandemic situations and the ethical considerations we need to be sensitive about during rationing (Fig. 1 – Table 2).

## Results

Rationing of healthcare resources is found to be a routine in some sectors of healthcare while the concept is under practice all over the world during times like pandemics. In the midst of infinite needs of healthcare resources whose availability is finite and varying in different countries, there is an immediate demand of country-specific ethical guidelines in rationing of healthcare resources.

## Ethical considerations in pandemic response

The concept of ethics in healthcare in general varies from the principles considered during a pandemic episode. The planning and response to any pandemic involve various steps to consider and evaluate for policymaking. Evaluating the content of pandemic preparations and response plans

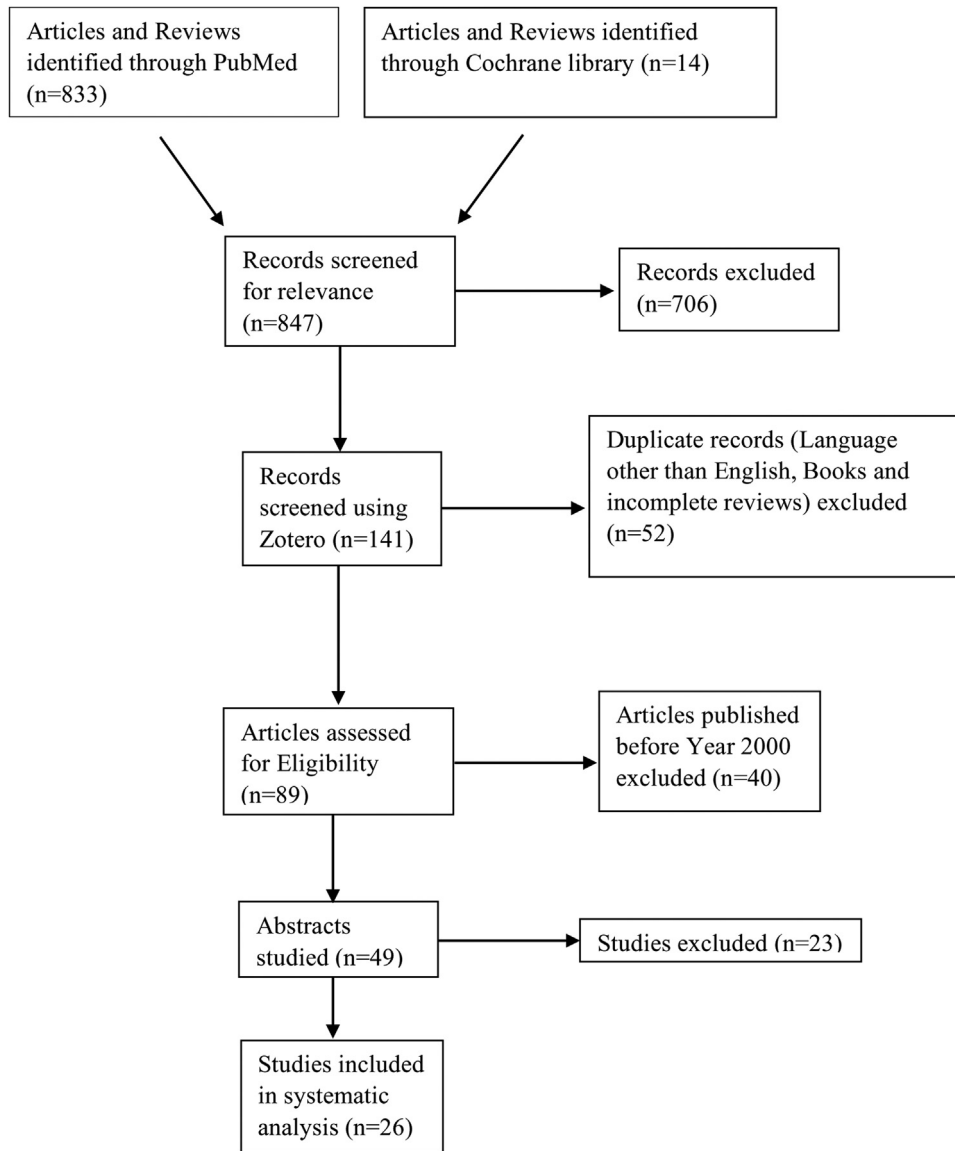


Figure 1. Flowchart of the study selection process.

includes duty-related and outcome-based considerations, as they constitute the policy to be developed. Preparedness planning for any pandemic involves balancing potentially conflicting individuals and community interests. The individual human rights and liberties during an emergency become limited due to public interest [11].

Individual liberties may be sacrificed for the health of the overall public, which may involve measures such as home quarantine, banning public meetings, or even significant disruption to normal life. During a pandemic, many aspects of the management plan, such as rationing of antivirals and vaccines, occupational risks to healthcare workers and their families, compulsory vaccinations of certain workers, cessation of many normal health services, and quarantine measures, would also raise major ethical issues [12].

Thus, public engagement and involvement of relevant stakeholders should be considered in all aspects of planning and the policy decisions should be disseminated widely [13]. Experience with previous epidemic health

emergencies, such as the severe acute respiratory syndrome (SARS), has shown that, without a clear ethical framework and an understanding of the decision-making process, decisions may not be readily accepted either by healthcare workers or by other members of an affected community.

Certain core values of our community, such as equality, liberty and privacy, may be challenged or re-prioritised by pandemic planning. The overall approach of the plan will aim to protect the greatest number of people in society from becoming unwell, and keep society functioning as optimally as possible [14].

The ethical values to be considered and protected during any pandemic response, aside from the four basic core principles, would thus include five elements (Fig. 2).

### Rationing and ethics

Rationing of resources occurs at multiple levels, which can be macro allocation – which occurs at the societal level

**Table 2** Characteristics of reviewed studies.

Objective	Authors and date	Design	Sample size	Geography	Study tool
Study 1	Pitlik SD – Rambam Maimonides Med J – 2020 Jul 31	Review		Israel	
Study 2	Emanuel EJ, et al. – N Engl J Med. 2020 May 2	Review	–	Massachusetts	–
Study 3	Zolkefli Y – Malays J Med Sci MJMS – 2017 Dec	Review	–	Brunei Darussalam	–
Study 4	Levin PJ, et al. – 2007	Review	–	New York	–
Study 5	Strech D, et al. – 2009 May	Systematic review	–	Germany	–
Study 6	Scheunemann LP, White DB – Chest – 2011 Dec	Review	–	Pittsburgh	–
Study 7	Binkley CE, Kemp DS – 2020 Jun	Review	–	San Francisco	–
Study 8	Farrell TW, et al. – J Am Geriatr Soc. 2020	Review	–	Utah	–
Study 9	Truog RD, et al. – Crit Care Med – 2006 Apr	Comment	–	Boston	–
Study 10	WHO Global Health Report 2019	Report	–	Geneva	–
Study 11	Skowronski GA – Curr Opin Crit Care – 2001 Dec	Review	–	Australia	–
Study 12	Vizcaino G, Esparza JG – J Infect Dev Ctries. 2020 Sep 30	Review	–	Ecuador	–
Study 13	Bailey TM, et al. – Vaccine – 2011 Apr 12	Review	–	Canada	–
Study 14	Torda A – Med J Aust – 2006 Nov 20	Review	–	Australia	–
Study 15	Adam EH, et al. – Eur J Anaesthesiol – 2020 Dec 18	Original article	74	Belgium	Validated 10-item Questionnaire
Study 16	Archer RA, et al. – Int J Technol Assess Healthcare. 2020 Nov 18	Review	–	Thailand	–
Study 17	Farrell TW, et al. – J Am Geriatr Soc. 2020 May 6	Companion article	–	Utah	–
Study 18	Savulescu J, et al. – 2020 Jul	Review	–	Ireland	–
Study 19	Brown RCH, Savulescu J – J Med Ethics – 2019 Oct	Review	–	UK	–
Study 20	Al-Shamsi HO, et al. – 2020 Jun	Review	–	UAE	–
Study 21	Cupp OS, Predmore BG – Am J Disaster Med – 2020	Review	–	Kansas	–
Study 22	Iserson KV – West J Emerg Med. 2020 Apr 13	Review	–	Arizona	–
Study 23	Kent DM, et al. – Diagn Progn Res – 2020	Review	–	Boston	–
Study 24	Mahmood SU, et al. – 2020 May 23	Review	–	Pakistan	–
Study 25	Sese D, et al. – Cleve Clin J Med. 2020 Jun 3	Review	–	USA	–
Study 26	Farrell TW, et al. – J Am Geriatr Soc – 2020 Jun	Review	–	Utah	–



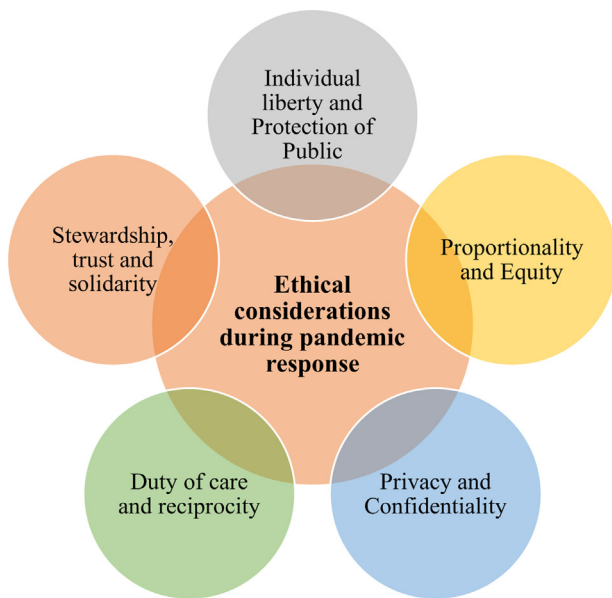


Figure 2. Ethical considerations.

and micro allocation – which occurs within healthcare setups like bedside decisions and ICU setups. Rationing also occurs due to general fiscal scarcity rather than the absolute scarcity of a particular medical resource [6].

**Rationing in critical care** – In light of a pandemic situation, one of the major issues in resource allocation arises in critical care. A study conducted across European borders focussed to assess their allocation preferences revealed a majority opinion that they should be made available for supraregional patients and a need for a central institution to manage such resource allocation [15]. Stakeholder consultation and public engagement during protocol development for resource allocation will be helpful to avoid conflict and understand the priorities of society [16]. This would eventually help in smooth implementation and adherence by professionals as no ethical norms will be overlooked or ignored.

As the COVID-19 outbreak is potentially life-threatening, the need to stick to the universal rules of ethics – justice, benevolence, and distributive justice are of paramount importance. Here, if something is missing, the victim would be losing nothing but their life. Hence, wealth, gender, caste, recommendations from higher authorities/political powers should be never allowed to intervene in providing medical services as all lives are equal unless otherwise justified [17].

To serve this purpose, the requirements of every stakeholder – from the healthcare service provider to other service providers to high-risk population and the common public have to be considered in-depth before and a standard set of guidelines has to be developed. This may not be universally applicable as the situation varies from nation to nation and thus every nation has to be encouraged to develop its guidelines and regulations.

This has to have two parts:

- system-wide rationing;
- bedside rationing.

System-wide rationing has to be implemented by the government officials, which covers the entire process of rationing and bedside rationing is the one to be followed at the hospital level for the patients. Whenever resources are found scarce, physicians must be given the freedom and encouraged to go for random allocation or lottery method [18].

The bedside physician knows better about the prevailing situation. In such a critical situation any decision on rationing, whether to provide the ventilator to one person or the other – is going to put the physician under severe moral distress. Hence, a blueprint on decision-making would be easing the physician to make the right decision without undue stress.

However, a couple of pragmatic considerations should be on the check, like ‘how much the individual would benefit from a scarce resource?’ and ‘whether the particular patient is worst affected so that he naturally qualifies for this care or facility?’ If a vaccine or other prevention medicine is available the frontline health workers and other high-risk populations should always be first. At the same time when allocating terminal care facilities like ventilators, only the true and most needed should be preferred.

Thus, certain approaches could be considered as guiding principles for policymaking like [19]:

- utilitarianism – To maximise overall benefits at a societal level;
- egalitarianism – Equal service and opportunity for every individual to have basic goods;
- prioritarianism – Prioritising those who are considered worst off in the distribution of advantages.

These considerations would help in forming the basis for decisions on the rationing of healthcare resources [6].

## Issues to be addressed

Issues with healthcare rationing arise from poor planning and implementation of unsuccessful policies. An informed social and political system needs to deliberately address healthcare policy and responsible methods of explicitly rationing care needs. Explicitly addressing the problem empowers society to mitigate the inequalities inherent in implicit rationing and enact policies more in keeping with societal goals. Scarce home care and follow-up of elderly and chronically ill patients and shortage of personal protective equipment during COVID-19 resulted due to poor planning and policy decisions [7].

There may be differences of opinions and disagreements based on how one views, values and judges the prevailing situation and the demands. Some may prefer ‘equality’ while the others may go far ‘maximum benefit’. A feasible resolution to this issue could be achieved utilizing an economic tool called ‘Normative economics’, whereby priorities are assigned based on associative value judgment to benefit all. This calls for policies that are transparent, collaborative with a system of accountability and equality [20].

Framing clear and deciding guidelines and make the allocation of resources fair and transparent would be the best protocol for long-term benefits when general public health is considered.

## Fair process of rationing

Transparency, inclusiveness, consistency and accountability are the four pillars that make the process fair and ethical [7]:

- being transparent with rationing is essential to keep the stakeholders of all levels, including the public well informed;
- inclusiveness is another process that makes those who would be affected by the rationing process question or challenge and potentially revise the guidelines through an appeal or suggestion;
- consistency means the process never deviates from the guidelines nor there would be any favoritism even to one's own family.

Accountability is the one that keeps those who make the decision stick to the fairness of the process. Some of the other considerations associated with this emergency mass critical care scenario include the supply chain, preparation, and solutions for potential shortages [21].

## Sectors of people and their priorities

People with different levels of exposure need different types of things. A personal protective equipment may never be needed by an already infected patient.

### Frontline healthcare workers

They are required to reach the maximum number of population and are encouraged to serve to help them remain infection-free. Hence, their requirements regarding protection must be given top priority and no quality compromise can be permitted. Also, there is another risk which is, if they get infected and carry on their work before knowing it, they would be the source of infection to many [22].

### Infected patients

Their need depends upon the stage of disease progression, where those in the early stage and symptomatic, would need isolation and certain vitamins and minerals. Here, equality is the only thing to be followed as a pandemic response and the concept of group fairness, which is not germane in shared decision-making, is of central importance in micro allocation [23].

### High-risk population/containment area

They are those who remain uninfected for the time being, but more likely to get. Thus, they should be requested to stay indoors and follow precautionary measures. Though they would not need any health-related care except immune-boosting supplements and food, the authorities have to ensure to make arrangements that the basic needs are available at their doorstep. Masks, respirators, gloves, and gowns or body covers should be ensured that it is used to prevent any invasion of the virus into their system [24].

## Services

### Testing

Testing facilities and the capacity of several tests performed are very much limited in many countries. Here, the purpose

of testing for COVID-19 has to be viewed from the public health angle. As there is no evidence-based medicine or vaccine available as of now, the more important purpose of testing a suspected person is to avoid the spread of the virus by isolating the positive ones than treating the person if positive [25].

Hence, testing always must be prioritized to the people at greatest risk, especially those residing in high-risk/containment regions. If the particular suspected person is the one who could have contacted more number of people in the recent past, definitely he/she should be considered as the top priority.

### Management

As of now managing COVID-19 refers to providing supportive therapy to prevent or delay the complications, symptomatic management, rest and nutritional intervention. Severe patients are recommended by (ICMR) to be given hydroxy chloroquine and azithromycin under medical vigilance. Here, in case of emergency management like ventilators, which are invariably scarce, the utility concept would be the best to follow by deciding who are expected to benefit from it and they should be given priority [25].

However, more attention and care have to be provided to the elderly, the ones with other comorbidities particularly chronic respiratory ailments and the risk factors for Non-communicable diseases like smoking, etc.

### Prophylactic equipment/measures

There must be no compromise in providing masks, gloves, personal protective equipments (PPE) to the Frontline healthcare workers. Rationing in these items should never arise and if any clinical physician refuses to go for duty in the isolation ward or attend a COVID-19 screening program, it must be considered quite ethical from their point of view. Even in providing masks and sanitizers to those like minor service providers and police personnel, there should never be a question of rationing. Any small amount of rationing or prioritising here would be undoubtedly unethical [26].

## Limitations

Our review focussed on the rationing of healthcare resources during pandemic situations and we could not discuss more rationing during COVID-19 due to limited references. The practical approach about rationing of resources could not be reviewed and hence we limited our review to the factors to be considered for health planning.

## Conclusion

While the entire world is dreaming of abundance, which is also seen in many developed countries in a wide range of goods and facilities even including healthcare resources, a pandemic episode brings up a completely different situation. Any new pandemic and the essential response planning to manage the condition are unpredictable. With existing healthcare resources and infrastructure, rationing of healthcare resources cannot be completely avoided. But any rationing if implemented with certain basic ethical values, complete essential medical service to those who deserve it, can be provided at ease.



Thus, the need of the hour is the practical ethical guidelines framed in coordination with the physician, Ethicist, and healthcare official and last but not least the common man, to bring out a fair policy with undeniable justice. Also, amid infinite needs of healthcare resources whose availability is finite and varying in different countries, there is an immediate demand of country-specific ethical guidelines in rationing of healthcare resources.

## Ethical considerations

Not applicable.

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## Informed consent

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## Disclosure of interest

The authors declare that they have no competing interest.

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