

Rationing of Intensive Care Unit Services: From Idea to Execution

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Abstract

Purpose: The World Health Organization introduces the health service rationing mechanism as a prelude to achieving universal health coverage. Rationing is defined as an intelligent policy in the fair distribution of limited resources. Scientific documents and studies and expert opinions propose beneficial, practical strategies and implementation solutions to establish rationing mechanisms.

Method: Medical databases have been searched for relevant articles in English and Persian. Extracted articles were reviewed by two authors and relevant data have been extracted. The data have been reviewed and agreed upon.

Results & Discussion: Development of clinical guidelines and adjusted protocols, redistribution of human and physical resources such as setting up intermediate care units, and designing and implementing appropriate financial mechanisms are the main strategic proposals in place to control the growing costs of the ICU services.

Originality: Scarcity of ICU beds especially in times of patient overload, such as the COVID-19 pandemic, will inevitably force hospitals to strictly stratify patients to assess the need for ICU care beds. Rationing of ICU care beds either to cut costs or for the sake of improved patient care in the time of overwhelmed health care facilities, requires extensive and careful pilot studies and ethical overviews.

Keywords: Rationing; Ethics; Critical care; Policy; Cost control

Abbreviations

WHO: World Health Organization; UHC: Universal Health Coverage; ICU: Intensive Care Unit; DNR: Do Not Resuscitate; HTA: Health Technology Assessment

Introduction

Rationing: A path to universal health coverage

Universal health coverage is recognized as a solution proposed by the World Health Organization (WHO) with the goal of "health without financial risks". The increasing costs of health systems, on the one hand, and their restricted resources, on the other, have made it difficult to achieve this goal. In this regard, health systems have utilized various strategies and programs to control costs and manage their resources as best as possible, some of which have been successful and some of which have failed [1].

There are many problems facing efforts to ensure universal health coverage due to limited resources and unlimited demands, therefore, WHO has introduced a rationing mechanism as an introduction to achieving universal health coverage and overcoming the above-mentioned problems. (WHO, 2010) In simple terms, rationing refers to the allocation of health resources taking into account existing constraints that deprive a portion of people of useful or potential advantageous health services [2,3].

Rationing of healthcare services as an effective cost-reduction method can be carried out through several mechanisms such as the refusal of care provision, waiting lists for diluted treatment care which can be classified at the patient, service provider, organization, and macro levels [4,5]. Overall, there are two main methods for rationing; The first method, called explicit rationing, is a situation in which the patient is of the services he or she is being denied and the rationale behind the reason. The second method, called implicit rationing, is a condition in which the restrictions on the use of health services is not clearly defined [6,7].

Rationing from a political and ethical perspective

Non-restriction of the provision of costly services can have catastrophic consequences and may immediately deprive resources and lead to the inability to provide any other kinds of service [3]. Rationing has provoked reactions from political and ethical perspectives. The mere non-use of the word "rationing" and absence of clearly defined policy does not change the reality of the restriction on access to health service resources, and may even provide uncontrollable decision-making power to lower-level authorities. Therefore, policymakers need to support cost-containment strategies such as rationing and invest in health services that produce the best results [2,3].

Ethical principles play an important role for health professionals. These principles being beneficence, non-maleficence, autonomy, and justice, health professionals frequently engage with these principles in their daily decisions. Hence, professionals may face ethical dilemmas which can be defined as difficulties in decision-making regarding ethical principles. Classically, in various clinical settings, ethical principles may conflict with each other, which are called old ethical dilemmas; for example, the do not resuscitate (DNR) consent conflicts between the principles of beneficence and autonomy [8].

In recent decades, a new generation of ethical dilemmas has emerged that goes beyond the physician-patient relationship and encompasses society. These dilemmas stem from the fact that there is not enough money in the health system to pay for medical services

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for everyone. These new ethical dilemmas originate from the principle of justice and how benefits and costs are allocated to the whole of the society, that is, the principle of distributive justice. These principles bring health decisions to a higher level than the individual physician-patient relationship. The obligation to control costs brings the principle of justice to the forefront of health policy in the rationing debate.

Thus, rationing has shifted from its general application, that is the restriction on the provision of services, so that not all useful services are available to all those in need to a more precise application, i.e. a cautious policy for a fair distribution of restricted resources. In other words, rationing means restricting the resources so that not all useful services are provided to all people in need as well as the fair distribution of these limited resources [9].

Rationing of intensive care unit services

In recent years, many health services in different countries have been subjected to rationing programs, one of which is the intensive care unit (ICU). ICU is a hospital ward with professionally educated staff and sophisticated equipment dedicated to providing health care at ultimate levels including monitoring, care, and treatment of patients with life-threatening diseases, injuries, or complications [10]. Achievements in other medical fields, including cardiovascular, transplantation, and oncology, have led to a rapidly changing trend of deadly diseases to chronic resource-craving diseases with frequent ICU admissions [11], therefore, these ICU care services are amongst the most costly services in the health system, accounting for about 1% of GDP in United States annually [3]. This high cost, when viewed in the context of resource constraints in health systems, highlights the need for rationing strategies for ICU care services [12]. In this regard, increasing rationing planning is developed for such services, and rationing methods are shifting from implicit to explicit methods [13,14].

Iran is also one of the countries facing the problem of increasing costs and lack of resources to achieve universal health coverage, and ICU services, as expensive services, impose a heavy financial burden on the health system.

Scientific documents and studies and the use of expert opinions, propose practical strategies and implementation strategies for policymakers and health professionals in the field of rationing of ICU services.

Methods and Type of Study

The present study has been carried out in two phases and has practical results. In the first phase, after reviewing available studies and literature, ICU services rationing strategies were identified and codified.

At this stage, information was collected through databases such as; PubMed, Cochrane, Elsevier, ProQuest, Scopus, and using Google Scholar search engine in the period 2000-2020. In this regard, keywords such as "rationing", "ICU care", "cost containment" and their Persian equivalents were used. Various studies such as quantitative, qualitative, time series, mixed, review studies that somehow referred to the rationing of ICU services and its solutions, and were published in the above period, were included in the study. Articles published before 2000 or written in any language other than English and Persian were excluded from the study.

Two researchers extracted the data using a data summary table, consisting of the title of the study, the names of the authors, the year of the study, the country of study, and the findings, and the differences were discussed and agreed upon.

Finally, the results of the present study were reported in a table and provided to the experts, who were selected using the purposive and snowball sampling methods, and the most informed people were selected based on the study objectives. However, due to the few and unavailability of informed people, the study was not saturated. Eventually, based on the opinions of experts, the extracted solutions were classified into 4 levels.

Results & Discussion

A review of scientific studies and evidence provides a set of strategic suggestions and recommendations for the rationing of ICU services, which can be classified into 4 levels (Table 1 and Figure 1).

System-level: policymakers, Ministry of Health, and insurance organizations

- Developing clinical guidelines for ICU admissions and service delivery: Considering the existing restrictions, the involvement of cost-effective studies in the development of clinical guidelines is a method of service rationing; therefore, at the national level, it is necessary to develop modified scientific guidelines through cost-effectiveness studies.
- Reviewing ICU Pharmacopoeia: Considering the high cost of medications used in the ICU, legal drug prescriptions were taken into account and if there are generic drugs, only these drugs should be covered by insurance programs, and if there are no generic drugs, access to expensive drugs should be limited using a mechanism such as setting a prescription limit for drugs.
- Designing and implementing an appropriate financial mechanism: In the ICU, many services are provided depending on the conditions and type of patients, and if there are no

Levels of policy implementation	Options
System (policy makers, Ministry of Health, and insurance companies)	<ul style="list-style-type: none"> • Development of adjusted clinical guidelines • Development of adjusted pharmacopeia • Design and implementation of appropriate financial mechanisms • Budget reallocation • Limited coverage of ICU services following elective surgeries • Designing and setting up intermediate service delivery units
Organization (medical schools and hospitals)	<ul style="list-style-type: none"> • Development and design of organizational clinical protocols • Redistribution of human resources
Service Provider(treatment staff)	<ul style="list-style-type: none"> • Aligning clinical judgment with clinical guidelines and organizational protocols • admission of patients based on the severity of the disease • Active discussion with patient's companions
Consumer (patient)	<ul style="list-style-type: none"> • Informing the public and the society about priorities and constraints • Price rationing

Table 1: Rationing options for ICU services at different levels.

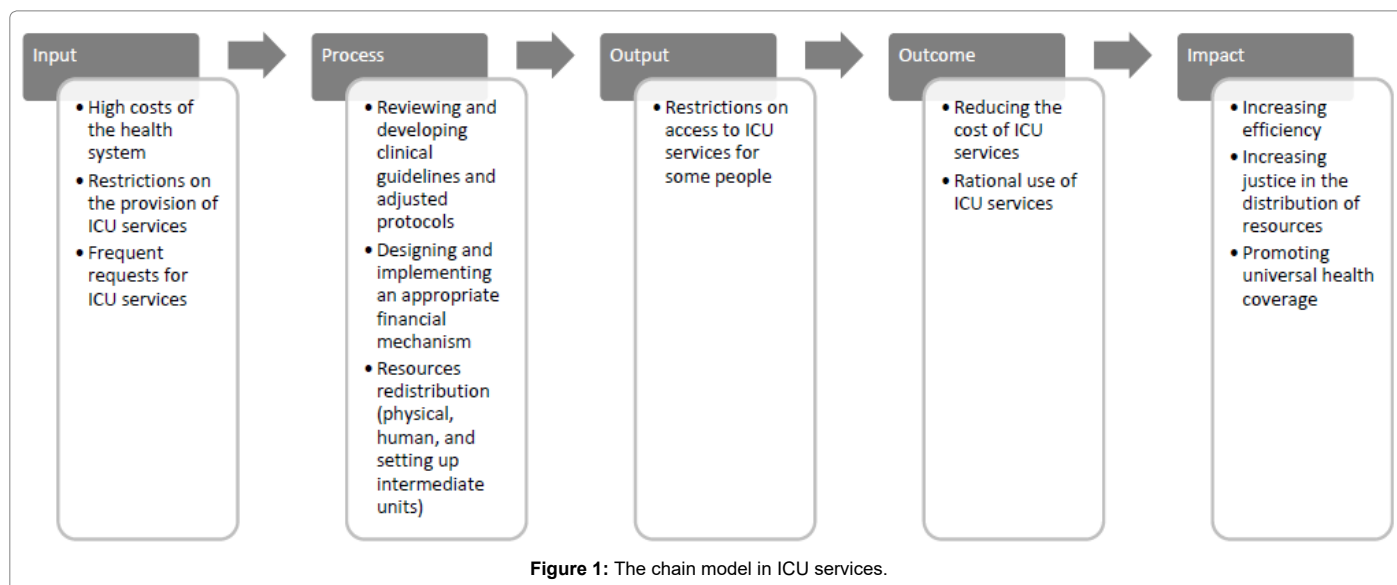


Figure 1: The chain model in ICU services.

appropriate financial mechanisms, problems such as increased costs and reduced efficiency will occur. Overall, it is possible to move towards rationing and cost reduction using two categories of deterrent and incentive measures as well as modifying financial mechanisms.

- Budget reallocation: Currently, a large part of the budget of health systems is spent on third-level services and ICU services, which can be reduced by redistributing these budgets and even reducing the budget of these wards using rationing methods. Here the important point is that redistribution should direct resources to preventive services and primary care services [13].
- Restrictions on ICU service coverage following elective surgeries: In many elective surgeries, the patient spends time in the ICU after leaving the operating room. The frequency of ICU admissions can be reduced by reducing the insurance coverage of ICU services after elective surgeries and thus reduce the related costs. As insurance organizations reduce cost coverage, self-rationing occurs as ICU care costs become more realistic.
- Designing and setting up intermediate care units: In many cases, patients need more services than services provided in medical wards and less than services provided in the ICU. In this regard, it is possible to reduce the load of ICU services by setting up intermediate wards and establishing this group of patients in such units. These units have a higher nurse-to-patient ratio than general hospital wards and also have higher facilities for monitoring patients, but have less staff and fewer costs than ICUs [15].

Organizational level: Medical universities and hospitals

- Development and design of organizational clinical protocols: To support the implementation of national clinical guidelines that have been developed at the policy level to reduce costs, clinical protocols should also be developed at the organizational level.
- Redistribution of human resources in the ICU to reduce unit-cost: This strategy allows us to reduce costs by reducing staff in ICUs and redefining their job duties or educating normal staff to undertake higher levels of care with less costs [10].

Service provider level: Treatment staff

- Decision-making based on clinical judgment and considering the organizational protocol to restrict the provision of services: This strategy enables the service producer to provide ICU services only to critically-ill patients, taking into account the resource constraints when there is no specified and dire need for these services.
- Admission of patients based on the severity of the disease: Based on this strategy, only patients who have a severe disease based on the caregivers' diagnosis, are eligible for ICU services [11].
- Engaging patient's companions in treatment decisions: In patients who are in the end stages of the disease and patients who do not benefit much from ICU services, the service provider can reduce additional prescriptions and daily lab tests by involving the patient's companions in the treatment process and explaining the situation and obtaining their consent. This process can take place individually or through organized committees [16,17].

Patient-level

- Informing people and society about priorities and limitations: This will increase the cooperation between patients and their families with the treatment staff. In other words, according to this strategy, the non-admission of patients with less potential to benefit from ICU services is more acceptable [16].
- Price rationing: If the costs of ICU services have become real and there is no insurance coverage in this regard, there will be a reduction in ICU admissions requested by patients and their families and these real prices will eventually lead to the self-rationing process [18].

Strategic Recommendations

Since there is no clear boundary to distinguish between different options at different levels, some options make sense at more than one level when implemented. Therefore, according to indicators such as justice, efficiency, cost reduction, and feasibility, and according to interviews with experts, "development of cost-reducing clinical

guidelines and adjusted protocols", "resource redistribution" and "designing and implementing appropriate financial mechanisms" were selected as the final proposals that had the highest compliance with the desired outputs and received the highest score based on the above-mentioned indicators. In this regard, we discussed strategic recommendations in the implementation of these options (Tables 1 and 2).

a. Development of cost-reducing clinical guidelines and adjusted protocols: Development of national clinical guidelines or revision of existing guidelines and aligning physicians' clinical judgment with clinical guidelines and organizational protocols are practical methods of rationing ICU services that enable us to clearly distinguish people

benefiting from and those deprived of these services. To implement this option, the following recommendations are proposed:

- Carrying out cost-effectiveness studies and health technology assessment (HTA) for new and existing technologies to evaluate high-cost and low-impact services and thus to exclude these services from clinical guidelines, which deprives some care recipients of these services.
- Engaging authoritative and influential stakeholders in the process of designing and developing clinical guidelines to prevent challenges such as non-acceptance and non-implementation.

Category Findings / Options	Clinical Guidelines, Clinical Protocols and Clinical Judgment	Financial mechanism	Resource redistribution (physical, human and setting up intermediate units)
Advantages	<ul style="list-style-type: none"> • Creating unity of action • Ability to predict costs • Quality assurance of services • Optimal cost management • Increasing technical, economic, and allocation efficiency • Reducing medical errors 	<ul style="list-style-type: none"> • Proper control of costs • Cost forecast if the ceiling is set. • High feasibility in case of financial incentives • Involving the provider in rationing-related decisions 	<ul style="list-style-type: none"> • Controlling and reducing the growth rate of service costs • The possibility of empowering human resources • Facilitating ICU discharge and reducing length of stay
Disadvantages	<ul style="list-style-type: none"> • Limiting the clinical judgment of physicians • Lack of attention to heterogeneity conditions • The complex application and difficulty of the process of convincing physicians to perform this mechanism • Lack of a universally accepted institution for developing guidelines 	<ul style="list-style-type: none"> • The need to a sophisticated monitoring system • The possibility of non-acceptance and formation of a pressure group 	<ul style="list-style-type: none"> • Deviation from standards • The possibility of a negative impact on distributive justice • Reducing the quality of services • High setting-up cost of intermediate units
Costs and cost effectiveness	<ul style="list-style-type: none"> • Low-development but high application cost with high energy requirement • High efficiency of operating costs 	<ul style="list-style-type: none"> • -High application cost • The cost effectiveness depends on the method of payment 	<ul style="list-style-type: none"> • Significant social costs in terms of physical and human resources • High operating costs • Long-term effectiveness
Uncertainty about the advantages and disadvantages of the option	<ul style="list-style-type: none"> • Uncertainty about increasing or decreasing costs • Inefficiency in case of improper adaptation of guidelines 	<ul style="list-style-type: none"> • Uncertainty regarding the possible responses at the provider level • •Uncertainty about cost reduction 	<ul style="list-style-type: none"> • Uncertainty about long-term cost control
Key points (how the option works and the reasons for its suitability)	<ul style="list-style-type: none"> • Based on current world evidence • Global use of it as a suitable method of rationing and reducing costs • Professional consensus as an efficient method 	<ul style="list-style-type: none"> • Appropriate international experiences with financial incentives • Appropriate and acceptable experiences of internal managers in this field 	<ul style="list-style-type: none"> • Appropriate international experiences • Increasing the technical and economic efficiency of the health care system • Reducing waste of resources and make optimal use of available resources • Appropriate flexibility to different clinical conditions
Experiences and views of stakeholders	<ul style="list-style-type: none"> • Non-participation of scientific associations in development of guidelines and defining no an institution agreed upon at the system level • Problems in using guidelines or their adaptation and costly monitoring the implementation of guidelines at the organization level • Failure to implement the guidelines at the provider level due to non-participation in the development process or non-development by specialized associations or the guidelines don't disclaim medical responsibility. 	<ul style="list-style-type: none"> • The simplest financial system has been used so far, and the existence of a mixed health care system (private and public sectors) makes it difficult to design a new financial system. • The problems of this financial system included discriminated payment to various providers and all of them need to cooperate during the treatment course. • The financial mechanism should be chosen in such a way as to reduce the risk of induced demand. 	<ul style="list-style-type: none"> • Political debates as well as distributive justice and access are serious challenges to its implementation. • The resulting social pressures will overshadow the successful application such redistribution. • It is very difficult to implement since manpower is an issue, especially in our country, which is mostly labor intensive.

Table 2: Critique of strategic options for rationing ICU services.

- Encouraging institutions through materialistic and non-materialistic incentives to develop compulsory organizational protocols in line with clinical guidelines and implement them through law enforcement and providing incentives to comply with those clinical guidelines which are not included in the form of mandatory protocols.
- Development of supportive rules in clinical guidelines with the active participation and support of decision-makers and judicial authorities to prevent defensive medicine, which increases costs by over-prescribing low-impact services [16].

B. Resource redistribution: Human resources alone account for half of the ICU costs [19], which if we add the share of other resources in this proportion, we will face a huge increase in costs. In this regard, a large part of the costs can be reduced using resource redistribution solutions, including the following:

- Reducing the service provider-bed ratio, empowering lower-level personnel to provide specialized services, or redefining job duties to provide cheaper services, which can help reduce costs by reducing the time it takes to provide service to each patient i.e. temporal rationing.
- Reducing growth in the number of ICU beds: Although according to epidemiological studies, the ratio of ICU beds to the population in Iran is lower than its standard, considering budget constraints, on the one hand, and the high cost of each ICU bed, on the other hand, it is recommended to currently reduce the growth rate in ICU the bed.
- Designing and setting up intermediate units: Despite depriving some patients of ICU services, this unit can be a huge leap towards controlling costs by reducing the load of ICU services. It is important to note that setting up these units is initially costly and is associated with bureaucratic complexities, but it reduces costs in the long run. These units also help reduce costs by facilitating discharge from the ICU and lowering prolonged ICU length of stay due to the lack of beds in the treatment wards. These new units require a new tariff system, an appropriate accreditation system, and the development of accreditation standards, which are among the bureaucratic complexities of designing and implementing these units [15].

C. Designing and implementation of an appropriate financial mechanism: Appropriate financial mechanisms are one of the main strategies in reducing costs and services rationing. It is important to note that we should consider the possible reaction of service providers to the financial mechanism. The following recommendations are proposed in this regard:

- Setting a cost cap for each service provider, especially for physicians: By summing up the total annual costs of each physician, the cost cap can be estimated for the next year, which in turn regulates the behavior of the service provider and limits overtreatment and provision of unnecessary therapies by the physician.
- Engagement of stakeholders in the design of the financial mechanism to prevent their possible resistance to new agendas.
- Engaging service providers' participation benefiting them from the advantages obtained from the process of reducing and controlling costs to regulate their behavior, therefore, easing the transfer of the rationing process to the level of service providers.

Our study did have some limitations, however, that affected our study. The recommendations made in this study are primarily based

on interviews with doctors and chiefs of general hospitals in Iran, therefore, international experts were not interviewed, and only local data have been mentioned.

Conclusion

Based on the findings and results, it can be concluded that ICU service rationing seems inevitable. Review of evidence and experts' opinions at the end, provides the three general suggestions "development of cost-reducing clinical guidelines and adjusted protocols", "resource redistribution", and "designing and implementing appropriate financial mechanisms" that are implemented at different levels as ideal methods of rationing.

Each of these suggestions includes a set of strategic recommendations to implement them as best as possible. However, it seems that the implementation of each of these recommendations requires further studies and pilot projects. It should be noted that although the distributive justice principle has helped address many ethical dilemmas, many of these dilemmas remain unresolved and require further debate and more transparent decisions.

Finally, it must be said that cost reduction is one of the main prerequisites for achieving universal health coverage and the goal of "health without financial risks". Rationing, as a painful method of controlling costs, should be considered as the last option to reduce costs. There is thus a need for further studies on cost reduction methods and the possible effects of rationing as one of these methods.

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Conflicts of Interest

The authors have no conflicts of interest to declare.

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