Letter to Editor

Health Economics; Retrospective (FFS) versus Prospective (DRG, Global,..) Reimbursement Systems and COVID-19 in the Health Sectors of Iran and the World

Sir,

Within the past 18 months, the prevalence of the COVID-19 (Coronavirus Disease 19) pandemic in the world (as well as in Iran) has fluctuated widely, but its trend has spread rapidly around the world. Despite the efforts of governments, this trend has been even greater in recent months in some less developed and developing countries. The prevalence of COVID-19 depends on various factors, such as health infrastructure, health, and economic, social, and cultural policies of countries and differs from country to country. The fluctuations in the spread of this disease in the form of different waves (first, second, third, fourth, etc.) have appeared in many countries, including Iran (battling the fifth wave of the disease).[1,2] One of the major concerns about COVID-19 is the financial and economic impacts of the disease on the health financing and reimbursement systems. The health systems are one of the largest sectors of the world economy. Global spending on health care accounts for approximately 8% of the Gross domestic product (GDP). In most developing countries, about 5–10% of government spending is allocated to the health sector. The Iranian health system, like other health systems, faces the challenge of drastically increasing health care costs.[3,4] The overall price index in the country has increased 30 times in the last 20 years. This growth has increased about 71 times in health expenditures. According to the World Bank studies, in developing countries, hospitals, as the key and most complex center in the health sector which exerts a great impact on health system productivity, account for between 50 and 80% of the total health spending. This is especially important for hospitals, as it is the most important component and the beating heart of any health system during the COVID-19 pandemic.[5]

Nowadays, not only the COVID-19 pandemic disease is one of the most important health problems of the health systems, but also one of the biggest economic, political, and social problems in the world (for any country with any level of GDP).[6] This challenge is less evident for the middle-income and higher-income developed countries, but more pronounced for low-income developing countries. The COVID-19 pandemic disease has several economic and financial effects at both the macro and micro levels. On the one hand, at the macro level, the economic effects of this pandemic have emerged as a shock or economic crisis.[7,8] This means that it has affected the financial and economic structure of countries, even economic and financial models (significant reduction in GDP, economic recession, and unemployment rate increase) around the world. On the other hand, this disease at the micro-level (households and health care services providers, such as hospitals) has severely affected financial resources and health care reimbursement mechanisms in hospitals.[1,4,5]

The concepts of health economics and subsequently hospital economics considering serious limitations in financing and how hospital reimbursement systems work are among the main challenges and concerns of health system policymakers. This is especially important with the onset of economic, political, and social crises such as economic shocks and disease pandemics. Hence, the main questions for the health system policymakers and decision-makers are, with such economic shocks or disease pandemic shocks, how efficient are the financing models and health care reimbursement mechanisms? In the case of the COVID-19 pandemic, what is the tolerance threshold of the hospital financial model? In the pre- and post-pandemic conditions of COVID-19, how is the efficiency of the financing systems and healthcare reimbursement mechanisms (including two main mechanisms of retrospective and prospective reimbursement) in terms of cost control, service quality, optimal resource allocation, healthcare production function, and revenue generation? Answering these questions highlights the need for discussing the key concepts, such as “health financing,” “risk accumulation,” “risk sharing,” “healthcare reimbursement systems,” and “retrospective and prospective reimbursement mechanisms,” in the health economics literature and hospital economics more than ever.[1,4,9]

The biggest problem for hospitals during COVID-19 is the hospital economics and the challenge of limited resources. The challenge of limited resources in the face of unlimited needs and the demand of patients in the hospitals creates many problems, including a large number of patients, poor quality of services, shortage of diagnostic tools and equipment, worn-out devices and equipment, long queues in ”clinics and outpatient surgery rooms, lack of medicine and other medical equipment, and shortage of medical, nursing, and other administrative support staff. Health economists address three main challenges in the field of hospital economics management, which are highlighted at times of crisis, especially during the COVID-19 pandemic. These challenges are the problems in areas such as of resource supply and production, the challenge of optimal resource management, and the challenge of resource allocation. The main economic challenges of resource allocation in hospitals, especially during the COVID-19

pandemic, are production and cost functions. These two functions are related to the challenge of hospital efficiency and effectiveness.[10,11]

The results of related studies (by the authors; Ahangar A. *et al* 2021) show that in Iran, within the past 18 months, the economic burden (both direct and indirect disease expenditures consequences) of the COVID-19 disease on the health system has been about € 3700 million. During this period, the total cost of inpatient admissions for the COVID-19 treatment was more than € 208 million and for outpatient admissions was around € 56 million. Accordingly, the average cost of a hospital stay for the COVID-19 patients is about € 1100 and of the COVID-19 outpatient treatment is about € 400.[1,12]

In addition in this study, the authors (Ahangar A. *et al* 2021) estimated, the diagnostics cost/diagnosis-related fees (COVID-19 diagnostic tests) in Iran during this period was more than €175 million, which was € 64 per patient on average. Meanwhile, in the same period, the costs of reducing production (performance) in the Iran health system (especially in hospitals) were about € 854 million and the costs of reducing production in the outpatient wards were about € 1020 million. Health financing and reimbursement mechanisms are some of the key and most challenging issues in health policy. Limited financial resources and inefficiency of some service payment systems have posed various challenges to most of the health systems around the world in terms of service quality, efficiency and effectiveness, and equity. To address this issue, governments use a variety of financing methods and payment systems.[13]

Financing has an extremely important impact on the performance of a health system. It determines how much money is available, who bears the financial burden, who controls the funds, how risks are pooled, and whether healthcare costs can be controlled. These factors, in turn, help determine who has access to care, who is protected against impoverishment from catastrophic medical expenses, and the health status of the population. All the money raised through any financing method (except for foreign contributions) comes, directly or indirectly, from the citizens. Each nation has to decide what sources to use and to what extent.[9]

According to Marc J. Roberts (2009),[14] one of the most important control nobs in health system reforms are the issues of financing and hospital reimbursement mechanisms. In other words, they are the most important factors that determine the consequences/outcomes of the health system.[7] In the case of the COVID-19 pandemic, studies (by authors) show that an appropriate reimbursement system is most effective in controlling costs and optimizing payments to a range of service providers. Conversely, an inappropriate reimbursement system wastes resources, incurs staggering costs, and adversely affects the achievement and performance of other goals of the health systems and hospitals.[15]

Today, reimbursement mechanisms in health systems include methods such as global, fee-for-service (FFS), per capita, salary, performance pay (P4P), and diagnostic payments (DRGs, diagnosis-related groups). Health reimbursement mechanisms are different across countries. This means that in some countries it may involve a combination of all of these mechanisms, and in some other countries, it may include one or two of these reimbursement mechanisms. It is important to mention that each of these reimbursement mechanisms has been established for a variety of reasons, such as the nature of the service and the hospital, having strengths or weaknesses, and enforceability and operationalization based on specific social, economic, and political situations.[1,15] The studies reveal that these mechanisms reflect various dimensions of quantity, complexity, and quality of health care in varying degrees given that the health reimbursement mechanisms are combined and updated with other technologies, such as hospital information systems (HIS) and hospital information technology (HIT).[16]

As a result, the performance and efficacy of each of these mechanisms or a combination of these mechanisms will be enhanced. Different financing mechanisms and the current reimbursement methods, according to the type of health system as well as conditions and requirements of each country, have strengths and weaknesses.[5,21] This issue, especially at times of crises such as the COVID-19 pandemic disease, is more highlighted. In general, hospital reimbursement systems are divided into two general categories of retrospective and prospective reimbursement systems. The hospital reimbursement systems are different based on various criteria of cost control, quality care, executive management, enforceability, and efficiency. In prospective reimbursement systems (such as DRG, case-mix, global, per capita, budget), a specific cost ceiling is defined based on the specific service package.[17]

In this method, it is assumed that patients in related and similar diagnostic groups have similar diagnoses and need the same amount of services. The prospective payment systems, such as DRG, aim to relate the amount of reimbursement to the volume of services (FFS: Fee-for-service) and quality of care provided. However, it is the opposite in retrospective reimbursement systems, such as FFS, salary, and P4P, in which there is fixed payment for each unit of service. This type of reimbursement system causes the phenomenon of supply-induced/supplier-induced demand by increasing the quantity and consequently reducing the quality of health care services [Tables 1 and 2].[18,19]

Studies reveal that there are different types of open and closed reimbursement systems based on/at micro and macro levels in the health sector [Table 3].[5,22] Accordingly,

Table 1- Comparison of different reimbursement systems based on key criteria

Type of payment mechanism	Cost control	Effect on quality	Executive Management	Efficiency in the COVID-19 pandemic period
FFS payment	very weak	Good (competitive conditions) Poor (SID)	Very difficult	low
P4P payment	Fairly good	weak	Very easy	Fairly low
DRG, case-based, and case-mix payment	very good	Very good	Difficult	Very good
bonus payment	good	good	Easy	good
Fixed rate payment	good	good	Easy	average
Per capita payment	very good	Fairly good	Very easy	good
Salary payment	Fairly good	weak	Easy	low
Budget payment	very good	Fairly good	Easy	Very good

Source: authors' analysis

Table 2 - Characteristics of different reimbursement mechanisms to health care providers

Type of payment mechanism	Define the basis of payment	Technical requirements
FFS payment	Any medical practice or service	Calculating tariff or price table
P4P payment	Any case of disease	Tariff table
DRG, case-based, and case-mix payment	Patint-day	Calculating costs, bargaining
bonus payment	For specific practices (immunization) or a specific behavior (such as low-priced prescription)	Making a list, calculating costs
Fixed rate payment	For approved investments	Preparing a list of approved items, calculating costs, and bargaining
Per capita payment	All services for each person in a one-year period	Calculating costs, bargaining
Salary payment	For a period of work (usually one month)	Bargaining
Budget payment	All services for the insured person in a period of time	Calculating costs, bargaining

Source: authors' analysis

Table 3 - Types of reimbursement systems based on levels (micro and macro) in the health sector

Macro level	Open system	Closed system
Micro level	Retrospective system	Prospective system
	Variable system	Fixed system
	Based on the unit of payment that can be different, such as FFS, per capita, per case, etc.	Based on criteria such as patient admission, patient discharge or a combination of both

Source: authors' analysis

in open payment systems, the health care providers and service providers are reimbursed based on the amount and type of services and care provided. There are no budget constraints, such as the FFS method, and mostly it is a variable and retrospective system. Closed payment systems, on the other hand, are fixed payment systems that set a specified ceiling for certain packages of services over a specified period, and are unchangeable. For instance, the DRG, budget, case-mix, per capita, and P4P are closed payment systems, which are prospective.[15,17,18]

In a nutshell, the investigations done in several specialized and general hospitals of one of the universities of medical sciences in Iran have shown that before and after the COVID-19 disease, hospitals with prospective reimbursement systems (such as DRG and Semi-DRG, Global, Budgeting,...) are more efficient in terms of cost control, quality of service delivery, and executive management compared to hospitals with retrospective reimbursement systems. The prospective reimbursement systems, on the one hand, significantly increase the financial and clinical performance of the hospital, such as bed occupancy rates, bed turnover, revenue generation, and patients as well as the service providers' satisfaction. On the other hand, these systems reduce the average length of hospital stay and supplier-induced demand (SID) (unnecessary services) for hospital care services.[1,19]

In the world, many of the hospitals (European and Iran) are financed largely through government budgets and statutory insurance funds. There are several ways to organize these payments, and by changing methods, payers can influence hospital behavior. Specifically, well-managed payment policies can provide incentives for hospitals to deliver better and more cost-effective care. Different payment mechanisms have differing impacts on hospital behavior.[4,5,23] The optimum funding mechanism will depend on policy priorities, as well as the ability of the health care and hospital systems to manage the chosen payment method effectively and affordably. Hospital performance is a critical issue, and payment mechanisms offer some of the most promising ways to foster improvement. Yet no single payment model is obviously superior, and particular solutions must be considered in

context. Ideally, a country's approach to hospital payments should reflect societal priorities, including the relative importance of efficiency, quality, and health outcomes. For maximum effectiveness, payment reforms should also be integrated with the information system, management, and monitoring reforms.[1,18,20]

Financial support and sponsorship

This study was conducted with the financial support and assistance of Iran University of Medical Sciences, Research Center for Preventive Medicine and Population Health.

Conflicts of interest

There are no conflicts of interest.

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Received: 12 Sep 21 **Accepted:** 11 Oct 21
Published: 05 Oct 22

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Website: www.ijpvmjournal.net/www.ijpm.ir

DOI: 10.4103/ijpvm.ijpvm_405_21

How to cite this article: Nojomi M, Tehrani-Banihashemi A, Ahangar A. Health economics; Retrospective (FFS) versus prospective (drg, global,..) Reimbursement systems and COVID-19 in the health sectors of Iran and the world. Int J Prev Med 2022;13:124.