



## Calculation of the Visit Costs of Various Services Provider Groups: Improvement of Payment Mechanisms

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### ABSTRACT

**Background:** Initiatives to improve the quality of health services and reduce costs currently have centered around payment mechanisms. In Iran, like many other countries, the outpatient visit costs are paid via fee for service, while real-time visits and other details of provided services are not considered in the tariff setting process. This study attempted to calculate the visit costs of various service provider groups and compared them with tariffs.

**Methods:** In this cross-sectional research, the essential data about different costs were collected from providers' offices, standard time of each visit was achieved from Iran's Ministry of Health and Medical Education, current visit time of service providers was calculated based on health insurance companies' data across the country. After calculating the standard and current visit costs through the activity-based costing technique, main determinants of costs (major cost centers) were specified for use in probably future weighted tariffs in fee for service payment mechanism.

**Results:** The greatest difference between standard and the current number of visits was found in the Sub-specialist physician group (6784 in a year), and the greatest difference was between standard and current cost of visits in sub-specialist psychiatrists (126703 IRR). Staffing and rental cost centers account for the highest share of total visit cost (87 %).

**Conclusion:** This study demonstrated a significant difference between the current and standard visit costs with tariffs. Therefore, it is essential that policymakers improve the payment mechanism by modifying the visit tariffs for medical service providers. One suggestion in this way is using domestic relative value units according to costing research results.

**Key words:** Visit cost, Payment mechanism, Relative Value Units (RVUs)

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## Introduction

In Iran, about 8.7 % of the gross domestic product in 2018 is consumed by healthcare costs (1). The health sector plays an important role in the economy and social structure of communities. It can affect any investment made in the medical sector and social and economic sectors in the country (2).

Nonetheless, today's attitude of health service provision is adopted regardless of costs and expenses of services under the framework of plans and preset goals. It has raised the question of whether medical services can be provided while paying attention to its qualitative aspects through less resource consumption (3). The increasing demand for health services on the one hand and limited resources, on the other hand, have given rise to expensive health services (4). Moreover, the increasingly soaring health care costs worldwide, particularly treatment costs, have propelled health economics experts and even physicians in every country to seek a new strategy to control costs (5). The provider payment reform for three levels of the health care system in Iran is now one of the major priorities of the Ministry of Health and Medical Education (MOHME) (6). Recent initiatives to improve health services quality and reduce costs have centered around payment mechanisms (7).

Although the fee for service (FFS) payment method was considered to be effective in outpatient departments, some adjustments are necessary; for example, relative value units (RVUs) fee schedules would improve more than what they used to be (8). RVU is considered an objective measurement to gauge the cost of healthcare services more realistically and assist provider payment mechanism (PPM) system move towards value-based health services.

In Japan, the FFS payment method is combined with a nationwide price setting system to control costs (9). In the USA, each service fee depends on its relative value units (RVUs), which rank on a common scale the resources used to provide each service (10). Determination of Medicare about RVUs for each service contains three types of

resources. RVUs of Physician work account for the technical skill and effort, time, judgment and mental effort, and stress to provide a service. RVUs of practice expense account for the non-physician clinical and nonclinical labor of the practice, and expenses for equipment, office supplies and building space. Finally RVUs in the Professional liability insurance account for the cost of malpractice insurance premiums (11).

Using costing methods is a simple way to determined or judge about RVUs. Also, costing and cost analysis can help the managers of various departments, hospitals, and policymakers to determine how and to what extent the teams and institutions under their authority are fulfilling the public needs (12).

Activity-based costing (ABC) is one of the modern techniques broadly employed all around the world. One of ABC's distinctive features lies in its capability to accurately identify the costs and present non-financial information to improve performance and efficiency of activities (13). In mid-1990, hospitals adopted ABC for service cost calculation and management (14). ABC potentially modifies resources management and consequently enhances health service provider organizations' efficiency by an in-depth concentration on value-added interventions (15).

In Iran, outpatient services are financed through a fee-for-service mechanism, and the tariffs are the basis for payments. Visits tariffs are fixed for the same providers according to their education levels (Bachelors, Master general practitioner, Ph.D. Specialist physician, Psychiatrist, Specialist physician with fellowship, Sub-specialist physician, Sub-specialist psychiatrist).

However, different condition of service provision is not considered in tariffs determination. Different provided services, with different complexity and different quality in various physical conditions in the same education category, have the same tariff.

Considering some debates about the appropriateness of the process of tariff setting, the current research was carried out through a detailed analysis of outpatient visit costs, using the ABC



costing method in two standard and current scenarios and then compared with tariffs. The purpose was to survey the proportion of real costs and defined visit costs tariffs and make some evidence to propose for using in probably future RVUs setting in outpatient fee for service payment mechanism.

### Materials and Methods

This was an applied research project conducted through a descriptive, cross-sectional, and retrospective procedure inside several health care offices and all service providers over six months of 2019. According to statistics released by health insurance agencies in Iran, the essential data for cost calculation covered office equipment, the standard time of each visit according to MOHME separately for different groups, and the provider's office's current time status.

Data on costs were analyzed in four stages:

Stage 1: The gathered information on costs was analyzed and processed manually.

Stage 2: MS Excel was employed for final analysis and achieving the objectives of studying medical service cost.

Stage 3: The costs were calculated according to spatial planning areas because the greatest difference was found in the rents and rents differ in various regions. The researcher analyzed the costs separately for each region because the cost parameters varied in different regions. Such calculation procedure seemed rational since legal authorities zoned the regions. Furthermore, the MOHME put on agenda the subject of metropolitan areas or the health system hubs in an effort to realize equitable distribution of resources, equal opportunities, more accurate monitoring, prevention from duplicate actions, utilization of regional advantages, decentralization, and prevention from the accumulation of facilities, transfer of decision-making authority, the participation of universities in national and provincial issues, Article 77 of the Fourth Development Plan and its executive order, Articles 182 and 183 of Fifth Development Plan and bill ratified by the Cabinet on October 27, 2004.

Therefore, the costs were calculated separately for 10 spatial planning regions outlined by MOHME.

Stage 4: As one of the most important parameters in the professional rates model adjusted based on academic years, constituting the basis of the cost-opportunity model, was adopted by a GP. For instance, a professional rate for a licensed midwife is 4.7 against a GP. Hence, academic years seem rational for model adjustment. Moreover, the base salary and cost-opportunity of a GP in the health sector during 2016 was assumed to be 60 million Rials according to MOHME (Office of Tariffs). Stage 5: The costs were calculated in two standard and current statuses. Visit cost was obtained by dividing total cost by all conducted visits during the period, so the number of visits is an important parameter in the visit cost calculation. The Ethics approval Code of this research is IR.KMU.REC.1399.268.

### Results

Given the number of standard visits announced by MOHME (Table 1), a GP can visit 4 patients an hour based on the standard visit time (15 minutes) (16). With 6 hours of useful work in the office, the GP will visit 24 patients a day. Considering 265 working days, the GP is supposed to visit 6360 patients on an annual basis. Concerning the current status, the figure amounts to 7420 patients according to the accurate statistics provided by health insurance agencies and Social Security Organization (SSO) covering the Iranian GPs. This implies that an extra 1060 patients are visited by each GP every year, which undoubtedly affects the visit costs. The greatest difference between the standard number of visits and the current number of visits was found among specialized physicians, while the minimum difference was found among medical experts.

According to Table 2 the greatest difference between standard cost and the current cost was found in sub-specialist psychiatrist, whereas the smallest difference was found in medical experts. In all groups, the standard costs are higher than the current costs. Furthermore, according to Table 3, the largest difference between private tariffs and



current costs was found in specialist physicians with a fellowship.

Given the fact that security guards and janitors serve the entire doctors' building and each office needs to hire a receptionist, the research findings in

Table 4 indicate the staffing center and rental center account for the highest share in visit cost. In most medical groups, the two centers cover more than 87 % of visit costs. The cost-share of the workforce grows as it becomes more skilled.

**Table 1.** Standard and current numbers of visits during 2019

Service provider	Standard number of visits (annually)	Current number of visits (annually)	Difference between standard & Current number of visits (annually)
Bachelor's	6360	6625	265
Master's	6360	6890	530
General Practitioner (GP)	6360	7420	1060
MD Ph.D.	6360	7950	1590
Specialist physician	4770	10070	5300
Psychiatrist	3816	7950	4134
Specialist physician with fellowship	4770	7950	3180
Sub-specialist physician	3816	10600	6784
Sub-specialist psychiatrist	3180	9275	6095

**Table 2.** Standard and current visit cost for various service provider groups (in IRR)

Service provider	Standard cost	Current cost	Difference between standard & current cost	Private tariff
Bachelor's (4.04 %)	184112	175829	5888	Bachelor's (4.04 %)
Master's (5.50 %)	210920	198059	9080	Master's (5.50 %)
General Practitioner (GP) (8.80 %)	255142	218821	14858	General Practitioner (GP) (8.80 %)
MD Ph.D. (10.51 %)	389575	259423	20425	MD Ph.D. (10.51 %)
Specialist physician	342174	285002	67826	Specialist physician

**Table 3.** The difference between standard and current visit cost and private tariffs for various service provider groups (in IRR)

Service provider	Difference between standard cost & private tariff (IRR)	Difference between standard cost & private tariff (%)	Difference between current cost & private tariff (IRR)	Difference between current cost & private tariff (%)
Bachelor's	8283	5.46	14171	9.72
Master's	12861	7.47	21941	13.46
General Practitioner (GP)	36321	19.77	51179	30.32
MD Ph.D.	130152	60.58	150577	77.45
Specialist physician	57172	19.86	124998	56.82
Psychiatrist	64637	17.69	148630	52.82
Specialist physician with fellowship	135543	46.03	187944	77.64
Sub-specialist physician	58116	15.63	160921	59.80
Sub-specialist psychiatrist	33888	7.43	160591	48.75

**Table 4.** Share of cost centers in the visit cost

Different service provider groups	Share of rent	Other costs	Staffing cost
Bachelor's	41 %	1 %	47 %
Master's	35 %	1 %	54 %
General Practitioner (GP)	32 %	1 %	57 %
MD Ph.D.	28 %	1 %	62 %
Specialist physician	24 %	1 %	68 %
Psychiatrist	24 %	1 %	68 %
Specialist physician with fellowship	23 %	1 %	68 %
Sub-specialist physician	23 %	1 %	68 %
Sub-specialist psychiatrist	23 %	1 %	69 %

## Discussion

According to the results, there were some differences between standard, current and private tariffs of a visit. Standard visit cost was averagely 21 percent higher than the current visit cost in all surveyed groups. This deference is because of more visits number in the current situation than standard condition.

Also, the private visit tariff was averagely 22 % higher than the standard visit cost and 47 % higher than the current visit cost. This means, in both standard and current situation, tariffs are defined higher than real costs for per visit and rationally, this deference is higher about current visit cost. There is a considerable gap between tariffs and calculated real visit costs in conditions that standard visit time is not observed.

Differences between tariffs and real costs are not surprising in Iran, which is mentioned in other research results. According to the evidence, there are the same differences in hoteling costs in the global payment mechanism. Fattahpour and his colleagues showed that in Isfahan, in 53 cases of global surgery from 60 cases, patients' real hoteling cost was less than the amount paid in hospitals' global plan and just in two cases, hoteling cost was more (17). Although there is some evidence about higher real costs than tariffs in some cases like Janati and his colleagues' research that showed in ophthalmic hospital, from April 2013 to April 2014, in Tabriz, the cost of eye surgeries were more than approved governmental tariffs (18).

On the other hand, costing process of visit costs in different levels showed like many studies in the

health care system, staffing cost accounted for the largest share of total costs (2, 19-21)

In our study, staffing cost had the biggest participate in total cost (average = 62 %, SD = 0.08). According to the mentioned evidence, the cost of service delivery is determined mainly by staffing and rent costs are the second most important costs (average = 28 %, SD = 0.07) and consumables had a very small share and accounting averagely 1 % of total costs in various medical groups involved in this study. These results can be useful information for determining RVUs in the FFS payment mechanism. This point is mentioned that in Medicare, although the actual percentages vary from service to service, physician work and practice expenses comprise 52 and 44 percent of total Medicare expenditures on physician services, respectively (22). Although there are many other ways to improve payment mechanisms, some models require high infrastructure levels, which is strongly emphasized for developing countries (9). Therefore, using RVUs seems to be the first step toward modifying and adjusting the fee-for-service mechanism in the outpatient sector of health providing system.

However, in this study, costs vary widely around the country spatially about some branches like rent, we did not analyze data in the level of different provinces, but this analysis is more suitable for decision making at the macro level.

## Conclusion

There are differences between tariffs and the real costs of outpatient visits. The evidence about different parts of services cost can be used to



determine RVUs as the first step of fee for service payment mechanism adjustments.

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### Conflict of interests

There is no conflict of interests in the research process.

### Authors' contributions

Barouni M designed research; Jafari Sirizi M conducted research; Sabermahani A and Barouni M analyzed data; Sabermahani A wrote manuscript. Barouni M had primary responsibility for final content. All authors read and approved the final manuscript.

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### References

1. World Bank. Islamic Republic of Iran Health Sector Review <http://databankworldbankorg/data>.
2. Goeree R, Gafni A, Hannah M, Myhr T, Blackhouse G. Hospital Selection for unit cost estimates in multicentre economic evaluations. *Pharmacoeconomics*. 1999; 15(6): 561-72.
3. Ghiyasvan H, Zandiyan H, Moghadam TZ, Naghdi S. Cost of radiology services using the activity based costing (ABC) method. *Payesh (Health Monitor)*. 2013; 12(6): 595-605.
4. Jafari Sirizi M, Barouni M, Saber Mahani A. Analysis of cost price and net profit of paraclinical services in private and public sectors: a case study of Kerman city 2014. *Journal of Health Management & Informatics*. 2015; 2(4): 138-43.
5. Gholami K, Laali E, Abolhassani H, Ahmadvand A, Mohebbi N, Javadi MR, et al. Costs of hospital admission on primary immunodeficiency diseases. *Iranian Journal of Public Health*. 2017; 46(3): 342-50.
6. Olyaeemanesh A, Manavi A, Monazzam K. Documentation and studies conducted at the Department of Health Economics. Department of Health, Ministry of Health and Medical Education, Iran. 2004.
7. Ayvaci M, Cavusoglu H, Kim Y, Raghunathan S. Designing Payment Contracts for Healthcare Services to Induce Information Sharing: The Adoption and the Value of Health Information Exchanges (HIEs). Available at SSRN 2978862. 2019.
8. Babashahy S, Rashidian A. Payments of physicians employed in public and private hospitals after modification of surgical and invasive services tariffs. *Hakim Research Journal*. 2012; 15(1): 38-43.
9. Babashahy S, Baghbanian A, Manavi S, Sari AA, Manesh AO, Ghaffari S, et al. Insight into provider payment mechanisms in healthcare industry: A case of Iran. *Iranian Journal of Public Health*. 2016; 45(5): 693-5. PMID: 27398344.
10. Coberly S. Relative Value Units (RVUs). 2015.
11. Medicare Cf, Services M. How to Use the Searchable Medicare Physician Fee Schedule (MPFS). Baltimore: US Department of Health and Human Services. 2014.
12. Cao P, ToYabe S-I, Akazawa K. Development of a practical costing method for hospitals. *The Tohoku Journal of Experimental Medicine*. 2006; 208(3): 213-24.
13. Lee H, Manns B, Taub K, Ghali WA, Dean S, Johnson D, et al. Cost analysis of ongoing care of patients with end-stage renal disease: the impact of dialysis modality and dialysis access. *American Journal of Kidney Diseases*. 2002; 40(3): 611-22.
14. Ringelstein D. An Activity-Based Costing Assessment Task: Using an Excel Spreadsheet. *E-Journal of Business Education & Scholarship of Teaching*. 2009; 3(1).
15. Rajabi A. The role of activity based costing (ABC) system in governmental hospital services in Iran. 2008.
16. Cabinet decree, in Fifth Five-Year Development Plan of Islamic Republic of Iran. 2012, Parliament of Iran: Tehran. [In Persian]
17. Fattahpour A, Ebrahimi Dourcheh R, Rahimi M, Rafiee N. Comparison of hoteling cost of



- global surgery with real cost in Isfahan public hospitals, 2012. Evidence Based Health Policy, Management and Economics. 2017; 1(1): 47-53.
18. Janati A, Khosravi MF, Imani A, Javadzadeh A, Gharamaleki MM. Cost analysis of eye surgeries and comparison with approved governmental tariffs. Health Scope. 2017; 6(2).
  19. Zarekhormizi E, Bahrami MA. Absolute Cost of Hernia Operation using Activity Based Costing (ABC). Evidence Based Health Policy, Management and Economics. 2017; 1(1): 40-6.
  20. Gh G. cost price estimation of emergency ICU services in Imam hospital, [Besthesis]. Tehran: Tehran University of Medical Sciences, School of Public Health. 2003. [In Persian]
  21. Ebrahimi Z. Cost price estimation of ICU services in Shafa hospital. [Besthesis]. Kerman. Kerman University of Medical Sciences, health management and informatics faculty. 2008. [In Persian]
  22. Maxwell S, Zuckerman S. Impact of resource-based practice expenses on the Medicare physician volume. Health Care Financing Review. 2007; 29(2): 65-79.