

Towards Reforming Health Provider Payment Methods: Evidence from Iran

Saeideh Babashahy,¹ Abdolvahab Baghbanian,² Saeed Manavi,³ Ali Akbari Sari,^{4,*} Alireza Olyae

Manesh,⁴ and Raziye Ronasiyan³

¹Healthcare Management, Department of Healthcare Administration Management, School of Economics, University of Hacettepe, Ankara, Turkey

²Health Policy and Economics, Faculty of Health Sciences, University of Sydney, Australia

³Ministry of Health and Medical Education, IR Iran

⁴Department of Health Economics and Management, School of Public Health, Tehran University of Medical Sciences, Tehran, IR Iran

*Corresponding author: Ali Akbari Sari, Department of Health Economics and Management, School of Public Health, Tehran University of Medical Sciences, Tehran, IR Iran.
E-mail: akbarisari@tums.ac.ir

Received 2015 October 04; Revised 2016 June 29; Accepted 2016 August 01.

Abstract

Background: Equity of access to health and provider payment mechanism in healthcare is a worldwide debated. Healthcare reforms are primarily designed to improve productivity, economic efficiency and quality of care; however, an appropriate reimbursement of healthcare providers for services offered to patients and maintaining a robust payment mechanism are not elucidated yet.

Objectives: The current study aimed to develop a potential model of provider payment mechanism within and across different levels of healthcare delivery system in Iran.

Methods: A three-stage, qualitative approach was carried out in 2013 to complete the study. In the first stage, a range of databases were used to extract evidence-informed literature pertinent to provider payment methods from 1990 to 2015, and to develop an interview guide. A purposive sample of 15 key healthcare executives was then selected to explore the provider payment mechanism in the Iranian healthcare system through semi-structured interviews and focused group discussions. A preliminary model of provider payment was developed, which subsequently scrutinized by using experts' opinions through Delphi technique. Narrative analysis was used to analyze the data.

Results: A hybrid model of provider payment was developed for various levels of healthcare provision. The model suggested the adjusted capitation payment method as the best possible payment method for the first level of healthcare delivery. A combination of diagnosis-related group (DRG) and pay-for-performance methods was proposed for the secondary and tertiary services across the country especially for in-patient care. Fee-for-service (FFS) payment method suited for out-patient services than other methods.

Conclusions: No single payment method was emerged as the best predictor to accurately and fairly determine the providers' payment, and to serve patients' needs in all situations. A range of payment methods are required to be in place to tackle challenges faced by patients, providers, insurance companies and policy-makers.

Keywords: Health Reform Scheme, Health System, Iran, Payment Mechanism, Health Provider Payment Method

1. Background

Equitable access to the most cost-effective healthcare services is one of the major challenges faced by patients, providers and policy-makers during the past decades. Health provider payment methods are of crucial importance to this argument (1, 2).

It is commonly argued that payment methods should be adjusted in such a way that is economically viable and affordable to patients and reflects the performance of providers and the quality and safety of care delivered to patients. It is also argued that payment mechanism can significantly influence provider efficiency and reduce unnecessary health spending (3). These issues are more highlighted in countries where public and private sectors have a close interaction and can powerfully affect each

other. Current evidence suggests that inappropriate application of payment methods may lead to misuse of scarce resources (4-6).

There are several payment and adjustment methods by which healthcare providers can be paid or reimbursed. The payment methods range from the so-called global payments (such as capitation and salary) at one end of the payment continuum to discounted fee for service and fee-for-service (FFS) at the other end (6, 7).

In the global payment scheme, healthcare providers are paid a lump sum of money for a range of services provided to a defined number of population in a given time period such as a month or year. While under the capitation arrangement providers are paid per enrollee, not per service, salaried providers are paid a fixed amount which is

not tied to enrollees or services rendered within a period of time. Under a FFS scheme, however, care providers are reimbursed for each individual procedure or service provided to patients, based on the usual and customary price charged in the local area or based on a fee schedule (i.e., FFS) or pre-determined discount of the usual and customary charges in the local area (i.e., discounted FFS).

The common payment adjustments include bonuses, retrospective utilization targets and withholds. Bonuses include extra payments given to providers at the end of a specific period of time. Retrospective utilization target is a financial benchmark applied by insurance companies or health plans to determine provider bonuses. Withhold funds include percentage of the capitation or FFS payment used to give financial risks to healthcare providers and may be returned to them at the end of the year as bonuses.

While the payment methods are commonly designed to influence treatment patterns, the payment adjustments are developed to influence both treatment and referral patterns (8, 9). All of these payment and adjustment methods are reported useful for the primary healthcare and outpatient services (10). Other payment methods span from line-item budgets through global budget to per diem and case-based payments. Diagnose based groups (DRGs), the widest classification system of hospital cases and mix of in-patients (i.e., case-mix), was developed as part of the prospective payment method, and created to reflect the actual cost of treating patients for a variety of medical conditions (11). The organization for economic co-operation and development (OECD) countries managed to apply an integration of the payment and adjustment methods. These countries mainly use FFS, capitation and salary payment methods for primary/preventive healthcare and outpatient services; and employ budget, per diem and case-based payments for hospital services (12, 13). The UK and Canada, for instance, use per capita as an effective payment method for primary healthcare (PHC) services (14). However, over the past decades there has been a tendency towards DRGs as a basis for case-based payment system. France benefits from FFS and capitation for registered patients visited by primary care doctors and from salary method for doctors in public hospitals (15). A combination of global budgeting and other payment methods are major hospital payment methods in many OECD countries (16). Experiences from these countries suggest that reforming provider payment mechanisms is useful to reduce the costs of healthcare. Yet, various contracting options and associated economic incentives exist for different payment mechanisms in different health contexts. What remains unclear is what payment methods can be applied to a specific health system, and how payment mechanisms work in such a system.

There is always controversy over the proper application of payment methods in Iran. Iran had a total population of around 78 million as of 2014, with a growth rate of 1.3. This trend is estimated to continue by 2030. Most recent data showed that the total health expenditure accounted for 6.7 of gross domestic product (GDP) as of 2012 (17). As shown in Table 1 health expenditure increased about US\$ 74 per person from 2010 to 2012. Around 39% of the total health expenditure on public sector was paid by individuals in 2010, with an increase of 25% in 2012, and this trend continues to increase. Lack of an appropriate regulatory system in the country to effectively integrate FFS into the existing payment model largely contributes to this trend (17, 18).

Iran has a complex healthcare system of multiple public and private funders and providers of services, and three different but interconnected delivery levels that target patients. The first level of healthcare delivery refers to PHC services such as prenatal care and vaccinations. The PHC network was established in 1983 to decrease the inequity of access to health within and between rural and urban areas. Health houses in rural areas, urban health posts and health centers in urban areas were formed as the health system's first point of contact with people. This network was managed via district health centers (17, 19).

Secondary services are those healthcare and hospital services provided by medical/health specialists, and are largely located in the provincial capitals and metropolitan areas. The third level of healthcare delivery includes specialized, consultative healthcare for inpatient services, often through referrals from previous levels and within tertiary hospitals that are located in major cities (17). The public sector provides a considerable part of secondary and tertiary healthcare services in each province; however the private sector focuses largely on the secondary and tertiary healthcare in urban areas of the country (20).

Provider payment mechanism is historically rooted in FFS in Iran. FFS and per-case mechanisms are applied for outpatient services and visits, respectively. At the same time, salary and financial incentives paid to university faculty members and other physicians vary according to criteria such as complexity of procedure or specialty (17). Ministry of Health and Medical Education (MoHME) pays a line budget to public hospitals, of which a large proportion is reimbursed to medical and ancillary personnel through salaries. Other staffs (e.g., those employed by short-term contracts) are paid via hospital special revenue funds. The services delivered by hospitals are divided into two categories: There are 90 common surgery procedures (most common services used by Iranian patients) reimbursed via per-case payment method. Other services are paid in terms of FFS method whose fee schedules are determined accord-

Table 1. Iran Health Expenditure Indicators From 2010 to 2012 - World Bank^a

Health Expenditure Indicators	2010	2011	2012
Health expenditure, total (% of GDP ^b)	7.3	6.8	6.7
Health expenditure per capita (current US\$)	416	483	490
Health expenditure, public (% of total health expenditure)	39.1	43.1	49.0
Out-of-pocket health expenditure (% of private expenditure on health)	88	88	88

^aWorld Bank, data on health expenditure in Iran (2010-12), available at <http://data.worldbank.org/indicator/SH.XPD.OOPC.ZS>

^bGDP, gross domestic product.

ing to relative value units (RVUs) (17, 21). FFS (based on RVU fee schedule) was the prime payment mechanism in private hospitals (17, 22). Yet, a considerable proportion of financial risks are shifted to both patients and (often insurance companies) where many physicians do not have any agreement with insurance companies and patients have to pay out of their pockets for the received service. Baghbani in his commentary argued that considering the current health infrastructure, little flexibility exists to achieve equitable access to healthcare in a system hamstrung by a focus on historical funding, FFS payment method and isolated episodes of acute care, growing out-of-pocket expenses, workforce deficiencies and inadequate insurance coverage (23).

An updated version of RVUs was recently applied concurrently with the launch of health sector evolution plan (HSEP) in 2014 to gauge healthcare prices much more realistically (24). Accordingly, MoHME put the provider payment reform forward as one of its priorities on agenda in order to reach the goals of Iran's Fifth five-year development plan (2010-2015) and Iran's vision 2025 (17). The HSEP was primarily commenced to pursue national reformatory strategies including interventions to address equity of access to health and payment challenges faced by patients, providers and insurance companies in the health sector (25, 26). In an effort, for instance, physicians in regional and remote areas, received salary along with an amount of money called 'special payment for deprived areas' funded by MoHME and allocated via affiliated universities (17, 22). It was initially believed that the proposed PPMs would sustainably improve the performance of staff, their satisfaction and thus system productivity in the remote areas (26-28); however, the current review revealed that each method has its own downsides. Although the health status of Iranian population has improved during the last decades, lack of efficient payment method at different levels of healthcare delivery is a major challenge, threatening the health system per se (21, 23). FFS payment, for example, is frequently criticized for being an incentive for overutilization of services and supplier-induced demand, as it rewards volume and intensity instead of value (6, 17, 23). Lack

of a regulatory system to monitor FFS payment, brought some difficulties for health sector including acceleration in the rate of unnecessary services and increased expenses on health (22, 23).

Challenges posed by mal-administration or misapplication of payment mechanisms in Iran resulted in an increase in out-of-pocket expenditure on health per capita (29). According to Fazaeli et al., more than 2% of the population experience catastrophic health expenditure (30). It is at these interfaces that over 75% of medical university chancellors argued that the current provider payment methods need to be adjusted to fit delivery of all kinds of services. They reported that 'under the table' payment requested from patients increased their out of pocket expenses, and thus caused a financial burden on them (31).

2. Objectives

The current article aimed to prescribe an adjusted model of provider payment for different levels of healthcare delivery system in Iran. The model has the potential to inform policy about the current challenges confronting provider payment mechanisms.

3. Methods

A three-stage, exploratory qualitative study was carried out in 2013. In the first stage, a critical review of literature was conducted through Scopus, PubMed and Web of Science for a period of 24 years from 1990 to 2015. All English journal articles and reports related to the current study were reviewed to extract the relevant information about PPMs. Manual search was also applied to examine the Iran's fifth five-year development plan, health sector evolution plan and Iran's vision 2025. A combination of keywords: provider payment method/mechanism, budget, fee for service, capitation, diagnostic related group, pay for performance (P4P), per diem, case-based and/or healthcare were used. An interview guide was designed based on the findings from this stage and was scrutinized subsequently.

Next, 12 semi-structured individual interviews and three focus group discussions were conducted amongst key healthcare professionals and policy-makers to explore the current situation of PPMs in Iran. The participants included 15 several delegates from four main health insurance companies including medical service insurance organization (n = 1), army medical insurance organization (n = 1), social security organization (n = 2) and Imam Khomeini relief foundation (n = 1)], Ministry of Health and Medical Education (n = 4), academia (n = 2), private sector (n = 2) and other related governmental and non-governmental organizations (n = 2). These organizations/institutions were selected since they played a key role in the delivery and financing of healthcare services. Wherever needed, discussion panels were re-held to review the findings, and to reach a consensus on that matter. A preliminary model of provider payment was designed based on the information gathered from this stage.

Using the technique of Delphi research, in the third stage, the initial model of payment and findings from the previous stages were first circulated through email to 15 original participants (members of the panels) for their comments. Findings obtained from the first round were then emailed to 30 experts familiar with the issue under investigation to force consensus. Consequently, a hybrid model of provider payment emerged. Descriptive narrative technique, brain storming and STEEPV (including social, technological, economics, environmental/ecological, political and value based issues) analyses were followed at this stage to identify and extract the most influential factors affecting the PPMs in Iran (32-34). STEEPV analysis was used as part of this stage. The factors were ranked based on a Likert-type scale, ranging from 1 (the lowest) to 5 (the highest). The first 20 factors were selected by panel members and categorized under STEEPV (Table 2).

4. Results

In total, there were 15 participants in the interviews and panel discussions through three different focused group discussions and 30 more professionals participated in the Delphi stage to scrutinize the proposed model of provider payment. The findings revealed that a hybrid model of PPMs delivers more favorable outcomes within the Iranian health system than a single method of payment.

At the first level of healthcare delivery there are PHC services and general physicians (GPs) who work as family physicians. A potential PPM at this level could adjust capitation where a percentage of GDP (in the form of government budget) should be transferred to medical universities based on the population size and needs and area deprivation. Universities can then redistribute the allocated

budget to the PHC doctors and family physicians based on the fixed payment salaries or FFS considering the criteria such as population size and needs, area deprivation and level and quantity of services. Accordingly, physicians who deliver less service may be paid less salaries and vice versa. Bonuses can be also paid according to their performance or delivering certain types of services. This incentive is strongly suggested to be applied to local and remote areas where physicians are less motivated to reside.

In the second and third levels of service delivery, public and governmental institutions can benefit from applying a combination of DRGs, global payment method and pay-for-performance mechanisms. Using global payment is highly recommended for government/public hospitals. Other hospitals can allocate their financial funds through competitive market conditions and/or also based on their own performance.

Private inpatient healthcare services are recommended to go through DRG system of provider payment. Participants including panel members noted that the use of DRG payment method for private inpatient services would more likely boost the quality of healthcare services without any major increases in expenses. Most significantly, they argued that instituting DRG-based payments for inpatient services would trigger a decrease in the length of hospital stay, and thus reduce unnecessary pathologic tests and repeated medical images. Further, a set of criteria, rules and DRG adjustments might be considered for certain situations and certain types of hospital costs, to account for variations across different hospitals and case-specific attributes. This would possibly help and facilitate the input-, process-, and outcome-orientated ranking of hospitals in terms of their efficiency, performance and quality of care. Healthcare services provided to patients may then have varied payment options in terms of those standard measures.

Yet, it was commonly reported by the participants that DRG payments are administratively and operationally complex, and require a well-developed database of services, expenses and procedures. For them, a proper computer-based system is required to record different cases and categorize them into payment groups. They argued however that these challenges can be solved through providing profound infrastructures and advanced planning.

Findings showed that FFS payment would be most beneficial in out-patient departments, at both second and third levels provided that an appropriate RVU fee schedule is placed where it can be constantly measured and updated. The participants noted that while an updated RVU was implemented last year an accurate monitoring system is required to ascertain the appropriate implementation of

Table 2. Most Important Determinants Affect and Are Affected by Healthcare Payment System, Using STEEPV Analysis

Theme	Important Subgroups
Social	Rising public expectations in order to receive high quality services
	Doctors' tendency to earn more and work less
	No income ceiling for physicians
	Changing trends of disease burden
Technological	Rapid growth of medical technology
	Rapid growth of non-medical technology
Economics	Spread of "free-market" mindset
	Targeting subsidies
	Rise in inflation rate
	Human resources development and global competitiveness
Environmental	Air pollution in megacities
	Unbalanced geographical development
	Population density in country
Political	Rise of "decentralization" mindset
	Strengthening the quality assurance in health service delivery sector
	Integration of national and international policy-making
	Tendency towards specialization
Value based issues	Emphasis on patients' right in the health sector
	Patient based approach to health in sustainable development
	Emphasis on equal access to basic health services

Abbreviation: STEEPV analysis, including social, technological, economics, environmental/ecological, political and value based issues.

new RVU by various stakeholders. Similarly, the study findings showed that private institutions or hospitals may also adopt other payment methods according to their board of management. For example, they may pay physicians some rewards in addition to their regular payments.

5. Discussion

The current article aimed to investigate and develop a potential model of payment for healthcare providers at all levels of healthcare delivery system in Iran. The study is most likely the first attempt to propose a healthcare PPM model which possibly fits the three levels of healthcare delivery in the country. A hybrid model of payment was developed with the potential to be used at different levels and segments of healthcare system. No single method was found to respond to all complexities of healthcare sector at all levels of care delivery.

Currently, Iran's healthcare system confronts multi-dimensional challenges towards healthcare providers' payment, and lacks an integrated payment mechanism in effect (7, 17). The study findings tentatively showed that adjusted capitation payment is a useful method at the first level of healthcare delivery. This payment method should be adjusted in accordance with population diversity, needs

and size with a focus on their socioeconomic status (SES) (9, 17).

This is similar to countries such as Canada in which family physicians are reimbursed through capitated payment method which is largely adjusted to geographical regions. In those methods, physicians who work in rural and remote areas are paid some bonuses and incentives to adjust their salaries (35). Expanding family physician program with a focus on such bonuses in Iran and encouraging physicians to work in remote areas and let them stay in the deprived areas (26, 36). Applying such a strategy would appear useful in fulfilling a part of health reform plan in Iran. Likewise, similar capitation mechanism is applied to general physicians in the UK (37). Nonetheless, the capitation payment is under debate. World health organization (WHO), for example, highlighted that "limited or less than sufficient delivery" of health services for "high-risk groups" is one of the most important criticisms of capitation (3, 38). However, it is argued that through adjusted capitation method and payments based on factors such as age and gender (i.e., weighted capitation) the negative sides of this method will decline to a great extent (38). Studies suggest that patients with poor socioeconomic background likely find more benefits from an adjusted capitation payment method (37).

The second and third levels of healthcare delivery sys-

tem in Iran are more complicated in nature, and as such the payment challenges are potentially complicated, significant (17, 39) and at times contradictory. Evidence demonstrates that DRG is widely known as the most applicable payment method for services provided at the secondary and tertiary levels (40). Payments based on DRGs can be combined with P4P when it comes to inpatient services (38).

Previous research shows that the application of DRG payment method can bring transparency, efficiency and quality care to health systems (41, 42). In recent years, a larger number of developed (e.g., Germany, USA, France and Australia) and a few developing countries (e.g., Turkey) have turned to DRG and case-based payment mechanism (8, 43-45) and such countries gained prosperity in the expansion of their provider payment methods (46, 47). Better efficiency, reduced waiting time and enhancing the medical resource utilization are reported as the most significant consequences of applying DRG payment method in the countries (44).

Evidence shows that P4P resulted in higher quality of care, as this payment method provides financial incentives to healthcare providers (8, 45). Similar evidence suggests that the main achievement of P4P payment is improving patients' health status and decreasing costs of health services (46).

Despite the fact that P4P is widely recognized as an efficient payment method which promotes healthcare quality in Iran, many physicians might find this method confusing due to the varieties of benchmarks being used especially for performance assessment. It can also make the implication of program too complex and expensive to optimize the evaluation system. Government and associated local and national authorities are thus required to identify and apply suitable prerequisites before they apply P4P, and establish well-organized regulatory systems to monitor the payment methods. These programs should be performed step by step to increase health provider participation, and to prepare them to adopt new policies and practices and hence navigate changes.

Consistent with the existing research (40, 47), FFS was found - based on the RVU fee schedules - an effective payment method for out-patient services. As mentioned above, updated RVUs were applied to Iranian healthcare system last year. Although it is too early to come to any conclusion, according to the reports of national institute of health research (NIHR), many people are satisfied with most parts of this reformatory program (48). Yet, less satisfaction exists among healthcare professionals who complain about the new RVUs. Such dissatisfaction can be possibly offset by revising the whole provider payment mechanism throughout the country (48, 49). For example, FFS

payment method in Japan is applied along with a global price setting system to confine additional expenses. Likewise, in Germany, FFS is mixed with cost-containment policies; therefore a physician's final reimbursement can be adjusted according to sectoral budgets, and the total values calculated on their provision of health services (12). In countries such as USA, FFS payment method is satisfactorily applied in the ambulatory care sector (50).

It is widely known that some doctors split their hours between the patients in private and public sectors, and it is acknowledged that they tend to pay more attention to private patients, largely because patients in private sectors pay more for their care than those admitted to public care facilities. A possible explanation of this trend in Iran is that the current provider payment methods are too poor to feed physicians properly (17, 51). Even by launching HSEP and implementing new RVUs, there are still claims about insufficient income and income inequalities within and between different groups working in health sector. Reports demonstrate that some of these groups lobbied and attempted to sabotage the reformatory plans (49).

There is also evidence to suggest that poor performance and job dissatisfaction amongst physicians can be considered as pronounced issues that warrant further investigation to find proper mechanisms to improve the current circumstances (52).

Monitoring is a key part of the diagnosis process and control system when it comes to investigating the progress of every plan. There should be regulatory systems and continuous assessments to identify and remove the drawbacks at any stage of every reformatory initiative. Considering strategic points could significantly strengthen these monitoring systems. Most importantly, each plan could be more successfully accomplished if the roles of all available stakeholders and actors are considered pivotal in the process of monitoring (53).

A range of different assumptions are proposed about the proper use of payment mechanisms at different levels of healthcare delivery system across the world. Those mechanisms are supposed to be applied in ways that fit the financial system in each country. The dominant funding system in Iranian healthcare system relies highly on social security insurance which possibly moves toward a national health insurance system in future (19). In such a system, PPMs such as DRG and FFS are more compatible than other payment methods since these methods fit the prevailing financial system in Iran, and encourage and reward quality services (17, 54). FFS payment method may improve the reimbursement rates for in-patient and out-patient admissions provided that it is applied together with other payment methods such as DRGs (51, 52, 55, 56).

It is projected that Iranian health sector is becoming in-

creasingly out-sourced and privatized, and will rely more on private and non-governmental organizations in near future. For this reason, FFS payment method should be carefully assessed under the regulation of new initiatives; hence, they can benefit its potentials.

5.1. Conclusions

Appropriately designed payment methods have the potential to improve the patients' health status and the health system at large. In Iran, PPMs reform aims to achieve the goals of the fifth national development program (57). HSEP was launched in 2014-2015 to tackle some of the challenges faced in the health industry; however, more predictive and adaptive plans should be made to overcome the obstacles in different domains of health sector, especially those well-targeted on health provider payment methods. Several initiatives are developed to reinforce such a reform. Yet, the introduction of an inclusive payment approach is elusive. A hybrid model of PPMs was developed in the current study with the potential to make changes to different levels of Iranian healthcare delivery system. There is no 'one-size-fits-all' solution to payment challenges faced by healthcare providers in Iran.

What constitutes the proposed hybrid model, what benefits it brings and how it can be applied depends highly on a large array of contextual factors including, but not limited the ones relating to politics, culture, community, economics, organizational and institutional policies and guidelines, individual patients, etc.

It should be also noted that the model is designed to overcome limitations of the current payment methods across the healthcare centers and hospitals, and may not be applicable to other paramedical clinics such as laboratory and imaging services. The model was designed to show how payment methods can be applied in different levels of health system but it remains to be tested. Yet, the data is limited to self-report that may introduce bias.

Acknowledgments

Authors would like to acknowledge their sincere gratitude to Ministry of Health and Medical Educations for its continuous support. Many thanks to all individuals who participated in the focused group discussions and Delphi process as well. Authors are also extremely grateful to those who provided insightful ideas and expertise that greatly helped the research.

Footnotes

Authors' Contribution: Study concept and design: Ali Akbari Sari, Saeed Manavi; acquisition of data: Saeed Man-

avi, Saeideh Babashahy; analysis and interpretation of data: Saeideh Babashahy, Alireza Olyaei Manesh; drafting the manuscript: Saeideh Babashahy; critical revision of the manuscript for important intellectual content: Saeideh Babashahy, Abdolvahab Baghbanian, Ali Akbari Sari; administrative, technical, and material support: Saeed Manavi, Saeideh Babashahy; study supervision: Ali Akbari Sari, Alireza Olyaei Manesh.

Conflict of Interest: There were no conflict of interest regarding the material and results of the study.

Funding/Support: The study was financially supported by the Iranian ministry of health and medical education.

References

1. Frenk J. Dimensions of health system reform. *Health Policy*. 1994;27(1):19-34. [PubMed: 10133134].
2. Murray CJ, Frenk J. A framework for assessing the performance of health systems. *Bull World Health Organ*. 2000;78(6):717-31. [PubMed: 10916909].
3. Chernew ME. Reforming payment for health care services: comment on "physicians' opinions about reforming reimbursement". *Arch Intern Med*. 2010;170(19):1742-4. doi: 10.1001/archinternmed.2010.377. [PubMed: 20975021].
4. Ricketts TC. New models of health care payment and delivery. *NC Med J*. 2011;72(3):197-200. [PubMed: 21901914].
5. Witter S, Fretheim A, Kessy FL, Lindahl AK. Paying for performance to improve the delivery of health interventions in low- and middle-income countries. *Cochrane Database Syst Rev*. 2012(2):CD007899. doi: 10.1002/14651858.CD007899.pub2. [PubMed: 22336833].
6. Baghbanian A, Esmaili S. Introducing economic evaluation as a decision support tool in health care: A case review of ir Iran. *J Health Scope*. 2012;3(3):101-9. doi: 10.17795/jhealthscope-6774.
7. Sarikhani Y, Bagheri Lankarani K. Mixed payment method, the experience of a new payment method for health service providers in family physician program in Iran. *Shiraz E-Med J*. 2013;14(4):16651.
8. Bellanger MM, Tardif L. Accounting and reimbursement schemes for inpatient care in France. *Health Care Manag Sci*. 2006;9(3):295-305. [PubMed: 17016936].
9. Sibley LM, Glazier RH. Evaluation of the equity of age-sex adjusted primary care capitation payments in Ontario, Canada. *Health Policy*. 2012;104(2):186-92. doi: 10.1016/j.healthpol.2011.10.008. [PubMed: 22078665].
10. Brown MM, Brown GC, Sharma S, Landy J. Health care economic analyses and value-based medicine. *Surv Ophthalmol*. 2003;48(2):204-23. [PubMed: 12686305].
11. Baghbanian A. The emergence of adaptive decision-making in complex health systems: economics and resourcing of complex health systems: the emergence of adaptive decision-making in health care. Germany: LAP Lambert Academy; 2011.
12. Park M, Braun T, Carrin G, Evans D. Technical brief for policy makers. Geneva,; WHO; 2007.
13. Sturmberg JP, O'Halloran DM, Martin CM. People at the centre of complex adaptive health systems reform. *Med J Aust*. 2010;193(8):474-8. [PubMed: 20955127].
14. Barnum H, Kutzin J, Saxenian H. Incentives and provider payment methods. *Int J Health Plann Manage*. 1995;10(1):23-45. [PubMed: 10142120].
15. Babashahy S, Baghbanian A, Manavi S, Akbari Sari A, Olyaei Manesh A, Ghaffari S, et al. Insight into Provider Payment Mechanisms in Health-

- care Industry: A Case of Iran. *Iran J Public Health*. 2016;**45**(5):693-5. [PubMed: [27398344](#)].
16. Hornbrook MC, Berki SE. Practice mode and payment method. Effects on use, costs, quality, and access. *Med Care*. 1985;**23**(5):484-511. [PubMed: [3925251](#)].
 17. Olyaeemanesh A, Manavi A, Monazzam K. Documentation and studies conducted at the department of health economics. Iran: Department of Health, Ministry of Health and Medical Education; 2004-9.
 18. The World Bank . Designing and implementing health care provider payment systems: How to manuals. US: The International Bank for Reconstruction and Development; 2009.
 19. Mehrdad R. Health system in Iran. *Japan Med Assoc J*. 2009;**52**(1):69-73.
 20. Rashidian A, Joudaki H, Khodayari-Moez E, Omranikhoo H, Geraili B, Arab M. The impact of rural health system reform on hospitalization rates in the Islamic Republic of Iran: an interrupted time series. *Bull World Health Organ*. 2013;**91**(12):942-9. doi: [10.2471/BLT.12.111708](#). [PubMed: [24347733](#)].
 21. Babashahy S, Akbari SA, Rashidian A, Olyae Manesh A. Payments of physicians employed in public and private hospitals after modification of surgical and invasive services tariffs [in Persian]. *Hakim Res J*. 2012;**15**(1):38-43.
 22. Lankarani KB, Alavian SM, Peymani P. Health in the Islamic Republic of Iran, challenges and progresses. *Med J Islam Repub Iran*. 2013;**27**(1):42-9. [PubMed: [23479501](#)].
 23. Baghbanian A. Health scope in iran: the way forward. *Health Scope*. 2012;**1**(2):50-1.
 24. Iran Ministry of Health . Relative values of health services and tariffs Iran: MOHME. Iran: Iran Ministry of Health; 2014.
 25. Vosoogh Moghaddam A, Damari B, Alikhani S, Salarianzede M, Rostamigooran N, Delavari A, et al. Health in the 5th 5-years Development Plan of Iran: Main Challenges, General Policies and Strategies. *Iran J Public Health*. 2013;**42**(Suppl):42-9. [PubMed: [23865015](#)].
 26. Iran Ministry of Health . Health Sector Evolution Portal. Iran: Iran Ministry of Health; 2014.
 27. Cohen RI, Jaffrey F, Bruno J, Baumann MH. Quality improvement and pay for performance: barriers to and strategies for success. *Chest*. 2013;**143**(6):1542-7. doi: [10.1378/chest.12-2491](#). [PubMed: [23732583](#)].
 28. Dieleman M, Harnmeijer JW. Improving health worker performance: in search of promising practices. The Netherlands: Royal Tropical Institute; 2006.
 29. Moghadam MN, Banshi M, Javar MA, Amiresmaili M, Ganjavi S. Iranian household financial protection against catastrophic health care expenditures. *Iran J Public Health*. 2012;**41**(9):62-70.
 30. Fazaeli AA, Ghaderi H, Abbas Fazaeli A, Lotfi F, Salehi M, Mehrara M. Main determinants of catastrophic health expenditures: a Bayesian logit approach on Iranian household survey data (2010). *Glob J Health Sci*. 2015;**7**(4):335-40. doi: [10.5539/gjhs.v7n4p335](#). [PubMed: [25946936](#)].
 31. Sari AA, Babashahy S, Ghanati E, Naderi M, Lotfi SMT, Olyae Manesh A, et al. Implementing the full-time practice in Iran health system; perceptions of the medical university chancellors on its challenges, consequences and effective solutions [in Persian]. *J Kerman Univ Med Sci*. 2013;**20**(1):40-51.
 32. Sandelowski M. Focus on research methods whatever happened to qualitative description?. *Res Nurs Health*. 2000;**23**(4):334-40. doi: [10.1002/1098-240x\(200008\)23:4<334::aid-nur9>3.0.co;2-g](#).
 33. Nabipour I. Megatrend analysis of the health policies of IR Iran [in Persian]. *Iran South Med J*. 2014;**17**(5):1007-30.
 34. Esmailzadeh H, Rajabi F, Rostamigooran N, Majdzadeh R. Iran health system reform plan methodology. *Iran J Public Health*. 2013;**42**(1):13-7.
 35. Hurley J, Lomas J, Goldsmith LJ. Physician responses to global physician expenditure budgets in Canada: a common property perspective. *Milbank Q*. 1997;**75**(3):343-64. [PubMed: [9290633](#)].
 36. Aghaei Hashjin A, Kringos DS, Manoochehri J, Aryankhesal A, Klazinga NS. Development and impact of the Iranian hospital performance measurement program. *BMC Health Serv Res*. 2014;**14**:448. doi: [10.1186/1472-6963-14-448](#). [PubMed: [25269656](#)].
 37. Allen P. Restructuring the nhs again: Supply side reform in recent english health care policy. *Financ Accountability Manage*. 2009;**25**(4):373-89. doi: [10.1111/j.1468-0408.2009.00483.x](#).
 38. WHO . A safer future: Global public health security in the 21st century. Geneva: World Health Organization; 2007.
 39. Hajizadeh M, Nghiem HS. Out-of-pocket expenditures for hospital care in Iran: who is at risk of incurring catastrophic payments?. *Int J Health Care Finance Econ*. 2011;**11**(4):267-85. doi: [10.1007/s10754-011-9099-1](#). [PubMed: [21915727](#)].
 40. Forgiione DA, Vermeer TE, Surysekar K, Wrieden JA, Plante CA. The impact of DRG-based payment systems on quality of health care in OECD countries. *J Health Care Finance*. 2004;**31**(1):41-54. [PubMed: [15816228](#)].
 41. Busse R, Geissler A, Quentin W, Wiley M. Diagnosis-related groups in europe: Moving towards transparency, efficiency and quality in hospitals. England: Open University Press; 2011.
 42. Reid B, Palmer G, Aisbett C. The performance of Australian DRGs. *Aust Health Rev*. 2000;**23**(2):20-31. [PubMed: [11010575](#)].
 43. Greb S, Focke A, Hessel F, Wasem J. Financial incentives for disease management programmes and integrated care in German social health insurance. *Health Policy*. 2006;**78**(2-3):295-305. doi: [10.1016/j.healthpol.2005.11.011](#). [PubMed: [16343688](#)].
 44. Hsia DC, Ahern CA, Ritchie BP, Moscoe LM, Krushat WM. Medicare reimbursement accuracy under the prospective payment system, 1985 to 1988. *JAMA*. 1992;**268**(7):896-9. [PubMed: [1640619](#)].
 45. Gazi A, Tengilimoglu D, Top M, Tarcan M. Evaluation of performance based supplementary payment system made by personnel at the ministry of health hospitals: The example of ankara training and education hospital. *Financ Polit Econ Comments J*. 2009;**46**(538):53-74.
 46. Covalski MA, Dirsmith MW, Michelman JE. An institutional theory perspective on the DRG framework, case-mix accounting systems and health-care organizations. *Account Organ Soc*. 1993;**18**(1):65-80. doi: [10.1016/0361-3682\(93\)90025-2](#).
 47. Robinson JC. Theory and practice in the design of physician payment incentives. *Milbank Q*. 2001;**79**(2):149-77. [PubMed: [11439463](#)] III.
 48. Hashemi B, Baratloo A, Forouzafar MM, Motamedi M, Tarkhorani M. Patient satisfaction before and after executing health sector evolution plan [in Persian]. *Iran J Emerg Med*. 2015;**2**(3):127-33.
 49. Moradi-Lakeh M, Vosoogh-Moghaddam A. Health Sector Evolution Plan in Iran; Equity and Sustainability Concerns. *Int J Health Policy Manag*. 2015;**4**(10):637-40. doi: [10.15171/ijhpm.2015.160](#). [PubMed: [26673172](#)].
 50. Kaarboe O, Siciliani L. Multi-tasking, quality and pay for performance. *Health Econ*. 2011;**20**(2):225-38. doi: [10.1002/hec.1582](#). [PubMed: [20104571](#)].
 51. Mohamadinezhad G. A comparative study of hospital payment mechanisms among a selected countries, recommendations for healthcare reform in Iran [in Persian]. *J Health Admin*. 2003;**3**(6):50-7.
 52. Jabbari H, Pezeshki MZ, Naghavi-Behzad M, Asghari M, Bakhshian F. Relationship between job satisfaction and performance of primary care physicians after the family physician reform of east Azerbaijan province in Northwest Iran. *Indian J Public Health*. 2014;**58**(4):256-60. doi: [10.4103/0019-557X.146284](#). [PubMed: [25491517](#)].
 53. Bahadori M, Ravangard R, Alimohammadzadeh K, Hosseini SM. Plan and road map for health reform in Iran. *BMJ*. 2015;**351**:h4407. doi: [10.1136/bmj.h4407](#). [PubMed: [26285708](#)].
 54. Iranian Parliament Press . Debate of islamic parliament research center on increasing the service price in the private sector by the iranian physician council [in perisan]. Tehran: Iranian Khane Mellat Press; 2007.
 55. Simoens S, Giuffrida A. The impact of physician payment methods on raising the efficiency of the healthcare system: an international comparison. *Appl Health Econ Health Policy*. 2004;**3**(1):39-46. [PubMed: [15702939](#)].
 56. Jegers M, Kesteloot K, De Graeve D, Gilles W. A typology for provider

payment systems in health care. *Health Policy*. 2002;**60**(3):255-73.
[PubMed: [11965334](#)].
57. Management and Planning Organization . Law of the fifth economic,

social and cultural development plan of islamic republic of iran,
2009-2014 [in persian]. Iran: Management and Planning Organiza-
tion; 2011.