

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Induced Demand: A Challenge On the Way of Iran Health Revolution Program.

Mina Riahi¹, Yasamin Molavi Taleghani², Hamid Salehiniya^{3, 4}, and Marjan Vejdani^{5*}

¹MSc student of Health Services Administration, Health Department, Shahrekord University of Medical Sciences Shahrekord, Iran.

²PHD student of Health Services Administration, Health Management and Economics Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.

³Zabol university of Medical Sciences, Zabol, Iran.

⁴Iran University of medical sciences, Tehran, Iran.

⁵Iranian Research Center on Healthy Aging, Sabzevar University of Medical Sciences, Sabzevar. Iran.

ABSTRACT

By comparing indefinite demand and definite resources during the time, induced demand leads to an increase in the share of people in health costs. This may turn into a critical challenge in health system if not managed appropriately. The aim of the current study is to explain the different dimensions of influential factors in induced demand. In addition, changes in induced demand from the beginning of its implementation in the health program are studied as well. This study was carried out through semi-structured interviews with the managers of health care system in Isfahan Province, Iran, which offer health service in three levels: first, second, and third. After the implementation of seven packages of Health Revolution Program, four fundamental concepts of influential fundamental and social factors in induced demand, the organizational structure, and interested parties were studied in 2015. Our findings show that the health Revolution Program has caused an increase in induced demand through social factors (incremental demand, physician-centered system), fundamental factors (lost influence of Referral and Family Physician Programs), the organizational structure (weakness in the educational system, ignoring medicine ethics, lack of regulatory programs), and interested parties (suppliers and receivers). Induced demand increases the affordable costs index. This, in turn, influences the positive acquired results of the program and decreases effective allocation of national resources. This can be managed using such strategies as improving managers' insight about supporting induced demand control, appropriate planning in health care system, correcting the educational system in the field of health care, correcting the payment and referral systems.

Keywords: Induced demand, Health Revolution Program, Health care system managers, health care service

**Corresponding author*

INTRODUCTION

Induced demand theory is one of the important subjects of study in the field of health economics and health care management. Newhouse claims that health care providers are able to create induced demand for their services. This will become one of the most significant and controversial subjects in health economics (1).

Costs in health care sector in different countries have shown a drastic increase over the past three decades. Such factors as income, technology, and age explain this significant increase in costs.

Moreover, economists and policymakers emphasize on the inefficiency of supply and demand sections, which may induce demands in patients as a result of health service providers' behavior. The induced demand theory is a major area of research in health economics texts. (2, 3)

Nevertheless, there exists ample theoretical literature related to the concept of supplier-induced demand (SID) in the health sector. SID is seen as an example of what economists call externalities, an unintended side-effect of an economic interaction, resulting from the lop-sided principal-agent relationship, as it is called in organizational theory, between the patient and the physician. Economic transactions typically involve two parties, a seller and a buyer, whereas in the health sector the role of the buyer (the patient) is mediated by agents (the physician and sometimes the financing agency). The assumption is that the agent acts on behalf of the principal (patient) with only the best interests of the principal as guidance. If the agent is influenced by personal financial incentives to provide more or less services, more expensive services or other services than what would be in the best interests of the principal, it will be a case of SID. Anecdotal evidence exists to support the belief that SID is not uncommon in the health sector and that it may have considerable influence on the quantity and contents of health services. This influence has, however, been difficult to demonstrate with empirical evidence since there are typically many potential confounders which are uncontrollable in observational studies (5, 4).

Iran Health Revolution Program was developed and started by the current government of Iran in 2014. Its aim is to change the medical condition of the country and to improve equality and availability of health care services. In developing Health Revolution Program four influential factors were considered in the form of 7 guidelines including: decreased hospitalization costs, supporting physician to offer service in remote and deprived areas, presence of specialists in the hospitals of Ministry of Health and Medical Education, improving the quality of visit services in the hospitals of Ministry of Health and Medical Education, improving the quality of accommodation in the hospitals of Ministry of Health and Medical Education, financial support for patients with refractory or specific diseases, to propagate natural birth giving. Implemented changes in Iran Health Revolution Program in the framework of 7 aforementioned packages were developed in the first stage. The second stage was the hygiene program. The third is to define tariffs and the fourth stage of the program was public health insurance. Generally speaking, the Program influences the entire system of health and medical service of the country.

The aim of the current study is to identify the challenges from post-Program incremental induced demand in all levels of health care services. With the benefit of being supported by experienced managers and experts at Isfahan University of Medical Sciences, suggestions are made to control the challenge to help the Program succeed.

METHODOLOGY

The current paper is a qualitative study carried out in 2015. 13 experts were selected using targeted sampling including those with higher education and experience in management in hospitals (3 people), health care networks (3 people), health care centers (5 people), inspectors in monitoring and evaluating insurance in hospitals and health care centers (2 people). The experts in our population were introduced by interviewees and selected using Snowball method of sampling. The following criteria were used to select the population: having managerial and executive experience in the hospital, health care networks, and health care centers. Sample size was continued until information saturation. 13 interviews were carried out via telephone conversations. Letters explaining the aim of the study and the name of the researcher was sent to 8 managers and a date for the interview was fixed. Interviews were carried out at the interviewees' workplaces. All interviews were carried out in person and over the period of April to June 2015. It was simultaneous with the

implementation of the rest of the Program in the centers where interviewees were working. The average duration for interview was considered 70 minutes. All interviews were carried out by one of the authors (Mina Riyahi). In-depth interviews were done at different level of service to gain a better understanding of the subject of the study which helped the researchers compile a relevant set of questions.

In order to analyze the data Framework Analysis was used which includes 5 stages of familiarization: identifying thematic framework, indexing, charting, mapping, and interpretation. This method of analyzing is usually used for qualitative data in legislation studies (6). The form for the familiarization stage contains personal information and an abstract of the interview. The thematic form was organized after a session between the researchers. Then, the form of familiarization was studied. Interviews were indexed separately. One or two indexes were assigned to related sections of interviews.

Findings

Four fundamental themes and 17 groups were identified (Table 1).

Theme 1: Organizational Structure

In health care section there are various issues related to knowledge of which even an experienced physician might be unsure. Another issue is that what type of treatment will be more effective. We are not able to evaluate the absolute success in a reliable way, even after an event. When a treatment leads to the cure of a disease, patients will often consider it a success, while there might be many other treatments to the illness. The fact that physician has more knowledge about diagnostic and treatment options than the patient is referred to physician-patient information asymmetry. Normally there two systems considered as the fundamentals of a healthy society: Health care system and Educational system. A society can develop by investing in Health care and Educational systems (3). Increasing the medical costs of diagnostic or treatment cases whose necessity is not scientifically confirmed, is one of the concerns (7). It is of critical importance for health care system to avoid such possible violations by regulatory plans. This may decrease the incremental costs of health care and medical services.

Economical factor

The level of demand for a specific good or service primarily depends on its price or fee. Consumers usually are interested in buying more at the lowest price. Such a behavior is so influential; that is called Demand Rule. It is more widespread in the market of health care services. Demand for health care/medical service is affected by other factors than price, such as income, cultural beliefs, the disease and its severity, taste and priorities and the consumer, consumer's age, insurance coverage, supplier guidelines, time-consuming services, and genetics (4). Low price in health care market than those in other economic markets is among the factors leading to multi-prices services in health care market. It is also a reason to explain induced demand, especially when patients are supported by insurance companies. Factors such as low physician visit fee or K index in surgery are other examples. Decreasing the patient's share in paying the costs has shown its negative effect. Decrease in franchising of patients in public centers led to significant increase in demand (1, 4). Patients also need to incur additional costs of para-clinical induces services on the one hand, and hospital charges in private section on the other hand (4). Patients seek refuge in private clinics and medical centers from the long queues at centers of public section while they are hardly able to afford the expensive charges of private section. Payment methods have a huge impact on health care providers' decision making as well as efficiency and equality in Health Care and Medical Services System.

Inadequate Regulation

Necessary standards in providing health care services may include the number of prescribed medicine in a single prescription, the rate of prescribed antibiotics, the rate of injective medicines, including diagnosis of the disease in the prescription paper, the rate of C-section delivery in a hospital, the rate of prescribed paraclinical tests by physicians in both private offices and hospitals, and the number of days of hospitalization. Setting such standards and conducting regular observations on the performance of health care provider centers can decrease unnecessary medical services. In addition, monitoring the indication of services including

paraclinical, medical, and surgical services by regulatory authorities can decrease the induced demand to a great extent.

Inefficacy of quality control system and inefficiency of the regulatory system give rise to induced demand in many areas (7, 8).

Ineffective tariffs

Surgeons earn much more than general internists. There must be equality between surgeons and physicians. The tariff for a general internist visit equals to that of surgeons (9). Setting tariffs for medical services eliminates bribing. For internists and physicians whose income is from prescribing (non-surgical income) bribe is irrelevant. Setting real tariffs will lead to dedicating optimized time for examination, correct diagnosis, and decreased induced demand (5).

Inadequate implementation of referral system

Referral and Family physician systems have been widely used in many countries. By introducing health care and medical service provider, these systems limit the accessibility of specialists (5). Findings show that there is no such system in Iran. There is a referral system for villagers and needy people, but there is no referral system or family physician for public (12, 13). That a specialist does not devote enough time to examine and study a patient's condition is due to the absence of referral system. Patients go to specialists directly before they try other options (like going to health care centers or the office of a general physician) and specialists normally do not spend the required time for the patients (5,12).

The priority of treatment system to health care system

Driving people toward a treatment system leads to unnecessary induced demand (9,12). China improved health indexes few decades after establishing a revolution plan in their health care system in 1971. At the beginning of the plan in 1990's china put great effort to cover health care services under insurance, but due to extortionate medical costs they were obliged to decrease free medical services. Health care system authorities should note that revolution in health care system is quite different from revolution in a treatment system and each has its own requisites.

Investment in health care section delivers more advantageous results than in medical system, as treatment is time consuming and costlier (10).

Theme 2: infrastructure

There was not much diagnostic equipment in the past and physicians had to devote lots of time to examine a patient's condition (11).

Information asymmetry

Some of the services provided by physicians produce induced demand. That is, physicians are very well aware that patients do not know much about their illness and they induce some unnecessary demands. When patients are aware of their problems and what is needed to be done, unnecessary demands will not be induced (6). The market power of physicians is on the basis of that fact that physician has more knowledge about diagnostic and treatment options than the patient. This is called physician-patient information asymmetry. Physicians normally use the information asymmetry. The potential number of patients has an impact on the effectiveness of provided services. Reduced number of patients and demand give incentive to physicians to induce additional demands (7). In such a situation, per case fee for service, where services are unbundled and paid for separately, will appear more (8, 12).

Different therapeutic methods and absence of standard treatment guidelines

Physicians' responsibility in the whole system of health care is analogous as a goalkeeper's in soccer. It is the Physician who decided when a patient needs to be referred to the hospital, what procedures to be

done, and what drugs to be prescribed. Apart from the direct costs of services provided by the physician, there are a variety of other costs to be incurred by the patients which is shown to comprise 70-80 percent of the whole medical costs (8). Increased induced demand, ordering scientifically unreasonable tests as well as clinical and paraclinical procedures (such as Echocardiogram, MRI) are among the disadvantages of Iran Health Revolution plan.

Multi-dimensionality of health care

Considering the physical, mental, social, cultural and spiritual dimensions of health, health care system should change into a balance-based approach which adopts equity among different levels of prevention and controlling risky factors and focuses on public collaboration and inter-department cooperation (10). It is also necessary to consider health determinants in different levels such as personal characteristics, lifestyle, economic factors, and social factors including social wealth, social networks, and job characteristics.

Theme 3: social factors

Physician-centered system

Hiring physicians in all managerial levels in health care system on the one hand and an income gap between physicians and other groups involved in the system on the other hand have led to an increase in induced demand. Physicians are paid more than twice as much as other working groups in the system (6,8).

The culture of health care system

One of the fundamental problems is inadequate definition of disease and treatment. As long as the problem is not solved, the culture of health care system will not be reformed. When the health care system has a limited budget, it would be better to spend the limited resource optimally. In other words, a physician should visit fewer patients and devote adequate time to examine and study their conditions (4,5).

The predominant culture in society

Environment always affects both physician and patient. Economizing must turn into a social etiquette (4,13). It is of critical importance to conserve national resources especially when government allocates subsidies to medical services. From the social point of view, induced demand results in killing opportunities for patients who need care.

Advertisement

Advertisement has a direct impact on people decisions. It can lead people with no adequate knowledge to wrong routes.

Theme 4: the role of benefited parties

Physician's behavior

There are several reasons that physicians actions as the providers of health care services may lead to induced demand. Physician's incompetence of in recording the patient's history, examining, and diagnosing the Psychosomatic disease will lead them to order various paraclinical tests. While a physician must allocate 15 minutes to visit and examine each and every patient, due to unfair tariffs he visits the patient in 3 minutes and refers them to do different tests, ultrasonography, radiology, etc. patient has to incur the cost of tests and examinations (2,7). How some physicians and specialists examine the patients in offices is a different problem which remained unresolved even after implementing the health revolution program. Long queues to make an appointment to visit specialists in public hospitals reveal that the quality of provided services in some centers is not acceptable. While specialists do not make time to visit all the patients waiting in the queues (3,12).

Another problem is that physicians intend to visit the patients for several sessions. That is, a patient with a chronic condition is ordered to visit the doctor unnecessarily in short intervals. Sometimes several visits

are suggested for patients with simple health problems, while treatment of the illness can be completed in two or three sessions. Among the most dangerous induced demands is when the illness can be cured completely by medical treatment but the physician or specialist suggests surgery like suggesting C-section for a woman who can carry through the natural delivery (5,13).

Physicians’ request to increase the visit fee and tariffs and ignoring ethics leads to induced demand. Professional, ethical, and personal commitments oblige physicians to be responsible and honest, while avariciousness leads them to an opposite direction. Simply put, a physician can easily cheat the patient by inducing unnecessary demands and make more money and patient may never realize it. This is referred as to “physician induced demand”. In general, patient needs to consult a physician about their problem and to seek their instructions. In other words, patients trust physicians and follow their instructions (4,8). There must be conformity between work ethics and privileged culture. Considering the rich Islamic-Iranian culture in our country, educating medical ethics is a field that can be extended beyond the borders. Medical ethics must be forwarded toward the problem-based learning.

Patients’ behavior

Specialty of medical services, the importance of health, worries about effects and consequences of diseases lead the patients to obey the instructions of health care service providers. Unreal expectations of physicians from patients, seeing a doctor for simple unimportant problems, trusting physicians, and patient’s desire to use free services will induce unnecessary demands which in turn leads to wasting resources and time, stress and pain, low-quality health care services, unnecessary concerns about the illness, and increase in the share people of medical services costs. Antimicrobial resistance against antibiotics which emerges as a result of unneeded usage of antibiotics is an example of increasing induced demands in patients to receive more health care services (3,10). In many cases patients do not use expensive medicines, nor do they complete the prescribed course of treatment which results in emerging side effects (6). As a result, the family will need to incur new unnecessary costs. When the cost of treatment is low, families tend to receive more medical services.

Table 1: effective factors in increasing induced demand

Theme 1	Theme 2	Theme 3	Theme 4	
organizational structure	infrastructure	social factors	Physicians’ behavior	No comprehensive national information system
Weakness in educational system	Modernized demands	Physician-centered system	Ignoring work ethics and competitive environment	Spending a proportion of family income to unnecessary medical costs
Economic factors	Information asymmetry	The culture of health care system	Physicians’ desire to increase their visit fee	Irrelevant expectations from physicians
Insufficient monitoring	Different treatment methods and lack of standard medical guidelines	The predominant culture in society	Incentives to earn more	Complete trust in physicians
Inadequate tariffs	Multi-dimensionality of Health	Advertisement	Unnecessary regular visits	Unreasonable concerns
Inappropriate implementation of referral system			Not allocating enough time to examine and study the patient’s condition	Going to doctors for unimportant problems
Priority of medical system to health care system			Patients’ behavior	Desire to use free health care services and franchise
			Insurance companies	No monitoring on insurance companies
			Being defrauded by physicians	Compound financial pressure on insurance companies
			Increasing debts	No information evaluation system

Insurance companies

It is obvious that a patient with no health insurance tends not to incur the costs of unneeded medical visits, diagnostic and paraclinical tests. But those who benefit from having health insurance are more motivated to buy additional health services. Lack of monitoring and control over their payment system on the one hand, and no standard investigation on delivering services by service providers on the other hand make it easier for patients to request more additional unnecessary demands. Insurance has no power to interfere in the process of treatment and is obliged to pay its share (12,13). Many insurance companies owe the hospitals. This owe is growing day by day and results in great damages to the whole body of health care system (11). In addition, physicians defraud insurance companies, because they think insurance deductions are not fair (12,13). The decreased share of patients and consequently increased share of insurance companies to incur the costs, insurance companies are under pressure. To compound the challenge, lack of medical guidelines and standards to control the quality of services, imposed costs to the health system, absence of regular monitoring plans, no technology evaluation, and absence of a comprehensive information system have troubled the control of induced demand.

DISCUSSION

Being supported by experienced managers and experts at Isfahan University of Medical Sciences, this study aims to study the challenges of induced demand in health care system by implementing Health Revolution Program in Iran. Findings of qualitative studies are normally stated one by one and are held in the field of the subject matter. Our findings show that induced demand increased with implementing Health Revolution Program in Iran. This led to uncontrollable increase in costs, imposing unnecessary costs and compound pressure for insurance companies, because their resources to cover the increasing demands are limited. As a result insurance companies' debt to hospitals and other health care service providers grows day by day. They are likely to cancel their contract with hospitals and others centers. Induced demand may create unrealistically low costs. This is in consistency with many previous studies which showed the challenge of decreased efficiency of health care system in long term is a result of induced demands.

With regard to organizational structure factors, it is the inappropriate implementation of referral system which leads to patient's confusion and increases the number of visits and costs. Amporfu stated that induced demand may increase the costs that patients must incur without any change in their health condition. Increase in costs might be due to the quality or quantity of the received services. Besides being time-consuming, induced demand involve additional costs for patients. In other words it creates a plenty of indirect unnecessary costs to be incurred by patients. He also stated that changing demands under the influence of physician's instruction or suggestion may challenge the Market Theory and Consumer's Sovereignty. Induced demand can increase medical costs and lead to ineffectiveness. It will have a significantly negative impact on development in health care system (7). Weakness in educational system results in irrelevant diagnoses and treatment. This in turn will create information asymmetry between physician and patient. Setting inappropriate tariffs will induce a financial competition among physicians and increase the costs in treatment section. Falit et al stated that urologists who own cancer centers create huge amounts of costs for the U.S government (8).

Our findings on social factors showed that there is weak health culture in public and health care providers. Mahboobi et al. stated that free health care services has created this impression that free or cheap services must be used at the most. In the meanwhile some physicians may consciously or unconsciously induce unnecessary demands to earn more (9).

Borhanzadeh refers to social consequences of induced demand: wasting national financial resources, increase in unreal demand to receive services, creating black market in health care system, losing opportunities for needy people. Wasting time and money are the consequences that patients will face. Antimicrobial resistance against antibiotics, tolerating pain and stress, side effects of unnecessary medicines, side effects from unneeded surgery (like abscess, infection, deformity, depression) are examples of consequences from disease and confusion (10).

Induced demand may ruin the public impression of physicians as reliable consultants. This destroys public trust in physicians.

Modern technology and its products are other infrastructural challenges leading to induced demand. Palesh et al. showed that uncontrollable spread of technologies in the field of health is one of the pressure-making factors in health care system (11). In addition, using medicines and imported equipment without indication and inaccessibility of usage guidelines will lead to wasting a huge amount of national wealth of a country.

Findings with respect to benefited parties show that induced demand leads to unusual treatment methods which might be requested by the patients. This can create a desirable bed for frauds. It also spoils justice, because the required treatment is not offered by service providers. Abdoli and Varharami stated that the number of the ordered tests and the allocated time to study the patient's condition is a function of age and gender. With physicians who are not officially hired by government prefer the job to unemployment. Experience and specific services for patient are other effective factors that determine the number of experiments and the visit duration. General physicians, especially those who are not government employee, try more to induce demand in patients to use medical services. Hasaart found that increasing induced demand pass the opportunity of getting bargain from physicians to insurance companies and this in turn will decrease the fees and charges. Insurance companies will find it easier to control the costs through selective contracts and evaluating the benefit and the relative per capita (13).

Physical and/or psychological effects of the disease are among the important problems patients face. Induced demand may lead to delayed diagnosis of the disease. In addition, some medicines have significant side effects such as unreasonable usage of pain killers and Corticosteroids. Our findings show that one of the most important challenges of insurance system in Iran is the absence of Comprehensive Information Bank, lack of managerial stability, and lack of regulatory system. The latter has increased induced demand in insurance section and created lots of hiccups in insurance and health care systems of the country.

CONCLUSION

After Iran 1979 Islamic Revolution, Health Revolution Program is the first huge project dealing with health care services. Success of the program relies on allocating adequate financial resources to health and medical system of the country.

Society will benefit to a great extend if the treatment-based system is replaced with preventive services and insurance companies devote a considerable portion of their services to preventive actions and services. Authorities and hose in charge should note that tactful managing and organizing are of crucial importance to continue the health program. Without comprehensive management plan and fulfilling expectations the Program will definitely face challenges which do irreparable damages to the whole health care system. To achieve the goal of the program it is of vital importance to hire competence experts, because improving management is the solution to the aforementioned problems. Public coordination eliminates the problems gradually. In order for the Health Revolution Program it is required to eliminate induce demand by: defining ethics for the program, providing medical guidelines to improve the quality of offered services and manage the costs, extending the Family Physician Plan, implementing the referral system, reviewing the curriculum of ethics for physicians, investment in health care section, and enriching the health care culture of public.

REFERENCES

- [1] Keyvanara M, Karimi S, Khorasani E, Jafarian Jazi M. Experts' perceptions of the concept of induced demand in healthcare: A qualitative study in Isfahan, Iran. *Journal of education and health promotion*. 2014;3:27.
- [2] Delattre E, Dormont B. Fixed fees and physician-induced demand: A panel data study on French physicians. *Health Economics*. 2003;12(9):741-54.
- [3] Khorasani E, Keyvanara M, Karimi S, Jazi MJ. Views of health system experts on macro factors of induced demand. *International journal of preventive medicine*. 2014;5(10):1286.

- [4] Bogg L, Diwan V, S K, DeCosta A. Impact of Alternative Maternal Demand-Side Financial Support Programs in India on the Caesarean Section Rates: Indications of Supplier-Induced Demand. *Matern Child Health J.* 2016;20:11-5.
- [5] Morris, S., Devlin, N., Parkin, D., & Spencer, A. (2012). *Economic Analysis in Health Care* (2nd ed.). Wiley. ISBN 978-1-119-95149-0.
- [6] Liao X, Liu J, Robison N, Xie Y. [Framework analysis method in qualitative research]. *Zhongguo Zhong xi yi jie he za zhi Zhongguo Zhongxiyi jiehe zazhi= Chinese journal of integrated traditional and Western medicine/Zhongguo Zhong xi yi jie he xue hui, Zhongguo Zhong yi yan jiu yuan zhu ban.* 2014;34(5):622-6.
- [7] Amporfu E. Private Hospital Accreditation and Inducement of Care under the Ghanaian National Insurance Scheme. *Health Economics Rev* 2011; 1(1): 13.
- [8] Falit BP, Gross CP, Roberts KB. Integrated Prostate Cancer Centers and Over-utilization of IMRT: A Close Look at Fee-For-Service Medicine in Radiation Oncology. *Int J Radiat Oncol Biol Phys* 2010; 76(5): 1285-88.
- [9] Mahbubi, M., et al., Supplemental insurance and induce demand in veterans. *Medical veterans journal*, 2010. 2(8): p.18-22.
- [10] Borhanzade A. Induced Demand and the Cost of Tests and Its Impact on Cost and Family Health. *Laboratory Science* 2011; 11: 17-22.persian.
- [11] Palesh M, Tishelman C, Fredrikson S, Jamshidi H, Tomson G, Emami A. "We Noticed That Suddenly the Country Has Become Full of MRI". *Policy Makers' Views on Diffusion and Use of Health Technologies in Iran.* *Health Res Policy Syst* 2010; 8: 9.
- [12] Keyvanara M, Karimi S, Khorasani E, Jafarian jazi M. Challenges Resulting from Healthcare Induced Demand: A Qualitative Study. *Health Inf Manage* 2013; 10(4): 548.persian.
- [13] Hasaart, F., *Incentives in the Diagnosis Treatment Combination payment system for specialist medical care* 2011, Datawyse, Universitaire Pers Maastricht.