The Efficiency of Public Health Expenditure in Turkey Between 2003 and 2013

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Turkey launched a project in 2003 known as "Health Transformation Programme" (HTP), which enabled Turkey to make considerable progress and radical changes to the health care system. The programme in 2003 included the effectiveness and the efficiency factors within the process by setting them as the primary objectives to increase the health status of the population (effectiveness) and to use resources in the best possible manner and at the lowest possible cost (efficiency). Accessing services according to the need of patients and state benefits according to their ability to pay would be viable under these objectives. In this study, initially, Turkish National Health System will be articulated on a literature-study basis approach to measure the efficiency of public expenditure on health. Then, the measured level of the efficiency will be analysed in Turkey. The paper serves a purpose to analyse the efficiency based on the outcomes of heath service such as satisfaction with public health services over the period of 2003-2013. A simple linear regression was employed to test the degree of statistical relation between public health expenditure and satisfaction with public health care services.

Keywords: public health care finance, public health expenditure, efficiency

Introduction

Turkey has accomplished remarkable improvements in the National Health Service System (NHSS) over the last three decades, particularly after introducing the new Health Transformation Programme (HTP). Turkey's health care system has been undergoing a far-reaching reform process named HTP since 2003 and some radical changes have occurred so far in both the provision and the financing of health care services. Health services are today financed through a social security scheme, the General Health Insurance Scheme (GHIS), in which the majority of the population is covered and services are provided by both the public and the private sector facilities. The Social Security Institution (SSI) is financed through social security payments made by employers and employees. Government contributions, in case of budget deficit, have become a monophonic (single buyer) power on the purchasing side of health care services. However, on the provision side, the Ministry of Health (MoH) is the main actor that provides primary, secondary, and tertiary care through its facilities across the country. University hospitals overall are also a major provider of tertiary care. The private sector, meanwhile, has increased its operational range over the recent years, particularly after new

arrangements paved the way of the private sector-based provision of services for the SSI (Tatar, Mollahaliloglu, Sahin, Aydın, Maresso, & Hernández-Quevedo, 2011).

In this study, initially, Turkish National Health System will be articulated on a literature-study basis approach to measure the efficiency of public expenditure on health. Then, the measured level of the efficiency will be analysed in greater detail in Turkey.

Most pieces of academic research into health care efficiency focus on measuring the level of organisational efficiency. However, this article basically aims to give a comparison of the technical efficiency of health care between the major public hospitals in Turkey by the use of specific health indicators. In order to improve the health status of the country as a whole, a government needs to recast its policies by auditing the performance of the public hospitals with reference to their respective health indicators. Our article serves a purpose to analyse the technical efficiency based on the outcomes of heath service such as satisfaction with public health services over the period of 2003-2013. A simple linear regression was employed to test the degree of statistical relation between public health expenditure and satisfaction with public health care services.

History of Turkish Health System

Background of HTP

Turkey stepped into the new millennium with serious health care system problems such as loss of confidence in public health services, considerable amount of people without any kind of social security coverage, high concentration of the hospital bed capacity and the doctor numbers in the three largest cities at a rate of one third and almost half respectively, or other sorts of inequalities in the geographical distribution of health care personnel.

With the declaration of Rapid Action Plan (RAP) in 2002, the vision of the sector has changed towards providing health care services for everyone in equal conditions. To implement the vision brought with RAP, Turkey launched a project in 2003 known as "HTP", which enabled Turkey to make considerable progress and radical changes to the health care system. The MoH launched the programme in 2003, and then included the effectiveness and the efficiency factors within the process by setting them as the primary objectives to increase the health status of the population (effectiveness) and to use resources in the best possible manner and at the lowest possible cost (efficiency). Accessing services according to the need of patients and state benefits according to their ability to pay would be viable under these objectives.

In Turkey, there is a strong rationale for the MoH to adopt a systematic approach to Health Systems Performance Assessment. Indeed, the Ministry has been implementing the HTP aimed at improving the governance, efficiency, and quality of the Turkish health sector, and the continued successful implementation of this major reform programme is dependent on tracking its impact on health outcomes, outputs, and structures. The MoH has identified further monitoring and evaluation (M&E) capacity building as a critical issue for the HTP. This has become even more important following the development of the MoH Strategic Plan for the period of 2010-2014. This effort is part of the on-going reform of the public sector in Turkey that requires all sectors to establish five-year and annual strategic plans and budgets.

Historically, patients who could not afford to pay for hospital care would not be released and therefore, the HTP aimed to develop a social insurance model that would enable citizens to contribute in proportion to their ability to pay and to receive the necessary health services within the framework of the equity principle. Depending on the expenditure levels of households or individuals, a patient's payments for health care services

may have catastrophic effects. These expenditures have led households to start reducing their basic consumption needs such as food or clothing. A fair health financing system protects the population from catastrophic health expenditures. Out-of-pocket (OOP) expenditures are the predominant source of health financing in many low- and middle-income countries throughout the world. Unlike prepaid health expenditures funded through general taxation and public or private health insurance, OOP payments are generally considered inequitable and a high level of these is taken to indicate lack of fairness in a health financing system (WHO Regional Office for Europe, 2012).

HTP is offering to enhance the role of the MoH in terms of planning, controlling, monitoring, and evaluating rather than service providing. The responsibility of a state department involves policy-making, priority-setting, data collection and analysis, financing, and overseeing the local public health activities. Also in the re-organisation process, enhancing the autonomy of hospitals is the key factor. Social security reform is designed to avoid inefficiencies of insurance and duplications of health insurance. Also, family medicine practice is designed to mediate improvement in primary health care services. E-health was one of the other key factors to monitor the effects of the regulations and the outcomes to the policy-makers.

Turkey's economy rebounded vigorously following the global crisis, but in the process, external and domestic macro-economic imbalances emerged. Growth averaged close to 9% in 2010-11, with strong job creation. At the same time, the current account deficit widened to around 10% of GDP and consumer price inflation rose to over 10%. The on-going global slowdown helps reduce these imbalances somewhat, but they remain a source of vulnerability as the economy continues to depend strongly on foreign confidence and capital inflows in a fragile international environment.

Consolidation of previously fragmented health financing pools has begun. A major focus of the HTP was to consolidate the various social health insurance schemes into a single scheme managed by the SSI. A landmark Social Security Law mandating that the schemes be integrated was adopted in 2006. The final version of the law requires all beneficiaries to receive the same benefits package (access to public and private sector doctors, outpatient benefits and drugs).

The SSI has been working on various strategies to ensure the collection of premiums, especially from informal sector workers. It is mandatory for all Turkish citizens to enrol and contribute to the social insurance system unless contributions are paid by the state (as in the case of the Green Card).

Turkey's 2008 social security reform improved the coverage of public pensions and is expected to yield significant savings, but these are insufficient to ensure pension system balance over the long term. Pension spending in Turkey is still modest in comparison to high-income OECD countries at around 7% of GDP, reflecting a relatively young population. Current efforts to reduce social security deficits are focused on reducing informality through better monitoring, enforcement and awareness, and containing health expenditures.

Progress has been made on purchasing arrangements. It was expected that the consolidation of risk pools would make the SSI the key purchaser of health services through contracts with the MoH, university, and private hospitals and with other health care facilities. However, this consolidation has taken longer than anticipated and is still on-going. In this context, transitional purchasing arrangements have emerged. Currently, all MoH hospitals have the Performance Based Supplementary Payment System arrangements in place. The MoH is beginning to implement case-based payments based on diagnosis-related groups (DRGs). The introduction of DRGs will standardize prices for medical procedures and encourage greater efficiency in hospitals.

Development of Health Care System

Governmental efforts to provide a universal coverage to Turkish citizens have rendered concrete results. Fewer families now face catastrophic health outlays and the subsequent risk of impoverishment. Turkey raises finance for health care services from multiple sources. SSI contributions take the lead, followed by government sources, OOP payments, and other private sources. According to the most recent National Health Accounts (NHA) data, 87.7% of the total funds have been coming from SSI in 2013, followed by 8% from OOP payments and 9.6% from other private sources. Green Card Scheme[1] was over and transferred to the SSI. As seen in Table 1, private insurance companies, self-financed institutions, and international organizations have a small share in health financing, at a rate of 0.2% in 2012. The share of health expenditure from public sources as a proportion of total health expenditure was 73% in 2008 and 86% in 2013. Health expenditure between 2000 and 2004 increased mainly because of the reform initiatives that improved access to health care services and changes in the provider payment system. According to official figures estimated for 2012, 94.2% of the entire population was covered by public health insurance last year.

Table 1

Financing Structure of Health Expenditure

Structure	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
SSI	58.5	61.8	60.3	67.3	70.1	72.7	70.8	74.1	76.4	87.7
OOP	32.1	28.2	26.1	19	16.5	14.9	14.7	11.7	11.1	8.0
Green Card	4.2	6.4	10.1	11.3	11.3	10.4	12.7	12.6	10	0
Private funds										0.2
General health insurance										2.6
Others	5.1	3.6	3.5	2.5	2.1	2	1.8	1.6	2.4	1.5

Public expenditure on health care has steadily increased in line with the GDP growth. This trend indicates the increasing prioritization of health care in government policies. In Turkey, total expenditure on health as a proportion of GDP has risen from 2.4% in 1980 and 2.9% in 1999 to 4.4% in 2008, 6.1 % in 2012, and 6.3% in 2013 respectively. This increase is mainly the result of improvements in the public provision and financing of health services that have decreased the share of OOP expenditure.

This is comparable to the expenditure levels of other OECD countries and of countries in the European Union (EU). Total health expenditure accounted for 6.1% of GDP in Turkey in 2008, well below the average of 9.5% across OECD countries in 2010. As seen in Figure 1, the share of health expenditure in GDP was the lowest in Turkey, at around 6.1% in 2010 and 6.3% in 2012. The Netherlands had the highest share of its GDP allocated to health in 2010 (12%), followed by France and Germany (both at 11.6%). These shares remain well below the United States where health expenditure accounted for 17.6% of GDP in 2010.

In general, health expenditure tends to rise with income. OECD countries with higher GDP per capita tend to spend more on health. Given that Turkey has the lowest GDP per capita among OECD countries, it is not surprising that it also has the lowest health expenditure per capita, with expenditure of 913 USD in 2010. This compares with an OECD average of 3,268 USD in 2010.

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[1] The Green Card Scheme covers the poor, that is, those who can certify that their income is lower than one-third of the base wage rate determined by the state.
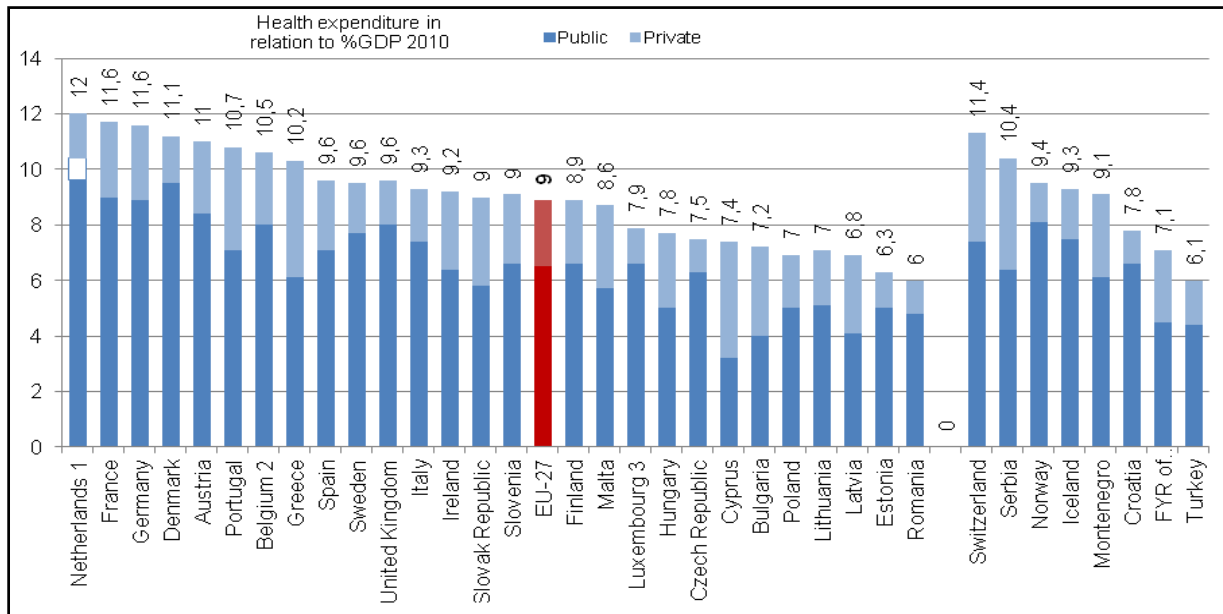
Figure 1. Health expenditure in relation to GDP. Source: OECD (2012).

Other Health Indicators

Despite the increasing numbers of doctors in recent years, Turkey has the second lowest number of doctors per capita among all OECD countries. In 2010, Turkey had 1.7 doctors per 1,000 population, almost two times less than the OECD average of 3.1 (see Table 2). Similarly, there were only 1.6 nurses per 1,000 population in Turkey in 2009, a much lower figure than the average of 8.6 in OECD countries.

Table 2

Health Indicators

Health care activity	2002	2003	2004	2005	2006	2007	2008	2009	2010	OECD average
Average length of stay, all causes, days	5.8	5.9	5.9	..	..	5	4.3	4.3	4.1	7.1
Doctor consultations, number per capita		3	3.4	4.4	5	5.7	6.3	7.3	7.3	6.4
Diagnostic exams, magnetic resonance imaging exams, per 1,000 population							48.8	67.6	79.5	46.3
Diagnostic exams, computed tomography exams, per 1,000 population							77.7	96.3	103.5	123.8
Discharge rates by diagnostic categories, all causes, per 100,000 population	79.44	81.56	84.51	..	..	10.55	11.20	13.40	14.24	15.51
Doctors, density per 1,000 population (head counts)	1.3	1.4	1.3	1.3	1.5	1.6	1.6	1.7	1.7	3.1
Nurses, density per 1,000 population (head counts)	1.1	1.1	1.2	1.2	1.4	1.4	1.5	1.6	..	8.6
Total hospital beds, per 1,000 population	2.1	2.1	2.2	2.2	2.4	2.4	2.4	2.5	2.5	4.9

Figure 2 shows an increasing trend in tax revenues and public expenditure on health during the period of 2002-2012. As we can see, the increase in public health expendeture was less than the increase in tax revenues.
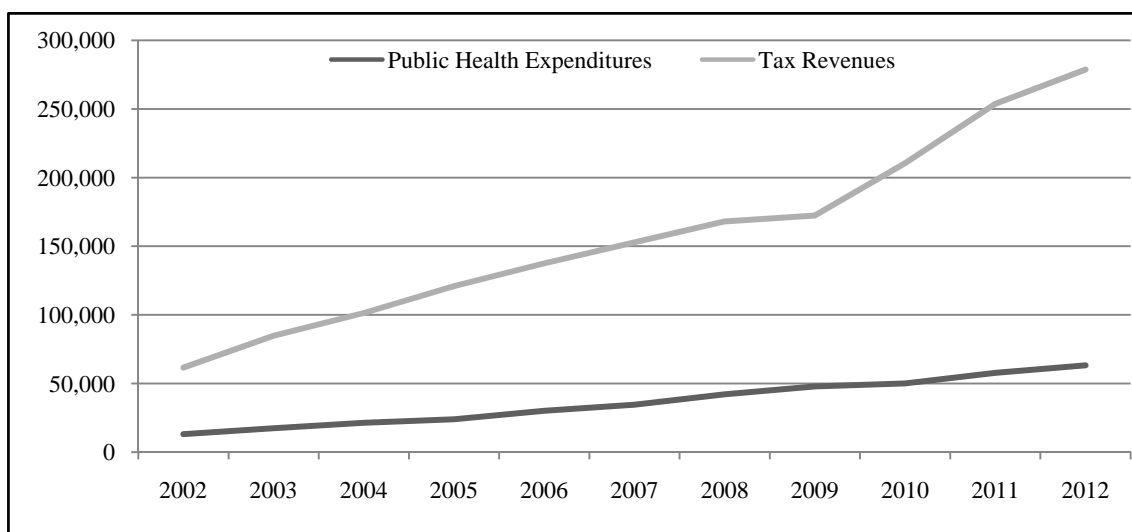
Figure 2. Public health expenditure and tax revenues. Sources: TurkStat, Ministry of Development, BUMKO.

The other health policies conducted in the last 10 years are as follows.

Tobacco smoking has shown a marked decline over the past 20 years in most OECD countries. Turkey has achieved some progress in reducing tobacco consumption, with the proportion of daily smokers among adults decreasing from 47.4% in 1989 to 25.4% in 2010. In Turkey, tobacco use is declining at unprecedented rates. Among the adult population, data from the Global Adult Tobacco Survey (GATS) 2012 which will shortly be released will show a decrease in tobacco use in the last three and a half years. Tobacco use is an important and preventable public health problem.

At the same time, obesity rates have increased in recent decades in all OECD countries, although there are notable differences. In Turkey, the obesity rate among adults, based on self-reported height and weight, was 16.9% in 2010. This is much lower than for the United States (28.1% in 2010 also based on self-reported data), but higher than the average of 15.0% for the 29 OECD countries with self-reported data.

Salt content in foods and the high average salt intake in Turkey have begun to decrease in response to a comprehensive salt reduction programme initiated by the government in 2011. Turkey is one of the few countries that have conducted a nationally representative 24-hour sodium urinary excretion study, which is considered the most reliable technique for estimating salt consumption.

The level of atmospheric PM10, tiny air pollutant particles small enough to enter and cause damage to the lungs, is 37 micrograms per cubic meter, considerably higher than the OECD average of 22 micrograms per cubic meter. Turkey also performs below the OECD average in terms of water quality, as 65% of people say that they are satisfied with the quality of their water, below the OECD average of 85%.

Efficiency

Empirical and theoretical measures of efficiency are based on ratios of the observed output levels to the maximum that could have been obtained given the inputs utilized. This maximum constitutes the efficient frontier which will be used as a benchmark for measuring the relative efficiency of the observations. There are multiple techniques to estimate this frontier and the methods have been recently applied to examine the efficiency of public spending in several counties (Herrera & Pang, 2005).

There are three concepts of economic costs. First, the estimates of the costs of ill health can be thought of as the upper limit of the economic benefits that interventions could generate. Second, by showing how ill health can reduce social welfare, slow the economies of both individuals and entire countries, and (possibly) exert upward pressure on health expenditures, it may be possible to capture the attention of policy-makers outside the health system. Third, while better health often produces tangible micro- and macro-economic benefits and may reduce future costs of health care; these are very small compared to the full economic benefit of improved health, which is the monetary value people attribute to better health. Policy-makers should, therefore, be encouraged to factor welfare costs into their economic evaluations of health improvements. Failure to do so risks understating the true economic benefits derived from health interventions (Farrell, 1957; Sajid, 2007).

In the case of health care, many studies using data for both developed and developing countries show that income is the major determinant of the population's health status, while the ratio to GDP of public expenditure on health care and the share of public outlays in total health care expenditure are relatively poor predictors of cross-country differentials in health indicators (Filmer & Pritchett, 1999; Filmer, Hammer, & Pritchett, 2000; Jack, 1999). Recent research on OECD countries suggests, however, that there is a positive, albeit weak, relationship between public expenditure on health care and premature mortality (Or, 2000). However, as in the case of health care, income tends to dominate the correlation between public expenditure and outcomes (Baldacci, Guin-Siu, & de Mello, 2003).

Measurement of productive efficiency is based on the relationship between output produced and inputs required for production. In the particular case of health care efficiency, despite that even the definition of output is not exempt from controversies, the literature on the efficiency of national health systems appears to have reached a consensus on life expectancy as the main output in the health care production function (Hernández de Cos & Moral-Benito, 2011).

The definition of health care efficiency does highlight the central role of quality, with a two-legged production process:

(1) To maximize health care outputs produced from a fixed set of health care inputs and input quality, holding health care output quality constant;

(2) To minimize health care inputs (related to cost minimization) producing a fixed set of health care outputs where input/output quality also are fixed.

Research

According to Oxley and MacFarlan (1995), micro-economic efficiency is the quality of care and consumer satisfaction should be maximised and costs should be minimized. Health care value is a function of quality, cost, and patient satisfaction. A good financial management for public health care will improve patient satisfaction and reduce costs. A health care strategy should focus on improving patient care without increasing costs. Improving health care facilities will become a challenge, calling for improving process efficiency and labour productivity.

Demographic development presages rising health care costs. In addition, in many countries, the current financial situation has put even more pressure on the public sector. The common challenges highlight the need to focus on quality control, quality improvements, and cost, in order to make health care systems sustainable in the coming years.

The role of patients has changed from being passive receivers to becoming actively involved in their own health care. Extensive evidence shows that patient engagement can improve patient satisfaction and increase adherence to treatment. It also leads to better clinical outcomes and increased efficiency in health care.

The patient assessment of the health services and the health staff in view of improving the level of quality is, in fact, respecting the consumer sovereignty. Increasing practice of conducting patients' satisfaction surveys may be an evidence of the shift from traditional doctor-patient relationship to provider-client attitude.

WHO, in World Health Report 2000, defined quality of health care through benchmarks of efficiency, cost effectiveness, and social acceptability (Smith, 2012). The report called attention to the importance of efficiency in all functions of a health system and in ultimately achieving the goals of health improvement, responsiveness, and fairness in financing. Technical efficiency refers to the extent that resources are being wasted. It measures the degree of producing the maximum amount of outputs from a given amount of inputs or, conversely, using the minimum amount of inputs to produce a given output. Examples of inefficiencies are excessive hospital length of stay, over-prescribing, over-staffing, use of branded over generic drugs, and wastage of stock (Hsu, 2010). Health services are also public goods, where there is a definite potential to improve the level of patient satisfaction with the service by tracking these dimensions. Reliability of the service would mean that the patient is seen according to his/her expectations and received the required treatment.

In this study, firstly the satisfaction with public services and public health services were examined with a comparison of OECD, between the years of 2002-2012. Health systems analysis seeks to understand the determinants of health system performance and to develop better policies and strategies for reform that improve that performance. Health systems analysis involves gathering data on health system inputs, processes, and outputs; and analyzing how these combine to produce the outcomes.

Satisfaction With Health Care Services

To measure the overall satisfaction of individuals with the main components of public services, as well as to determine the relevant changes in these respects over a period of time, Life Satisfaction Survey (LSS) which was first introduced in 2003 as a module of Household Budget Survey has been carried out regularly since 2004. According to the results of the survey, statistics are produced for the whole country at urban and rural levels. Within the scope of the survey, individuals who were above the age of 18 were interviewed in the selected households (TurkStat, 2010).

Level of happiness varies according to age groups. The level of happiness of the individuals at the 18-24 age group was 64.6% in 2012, and the percentage was 60.3% for the individuals at 65 years of age and over.

It can be seen that married individuals were happier than singles. While 63.9% of married individuals were happy in 2012, the percentage was 52.9% for singles.

Families and being healthy were the values that made individuals most happy. While the percentage of individuals who mentioned that their families made them happiest was 73.8% in 2011, the percentage decreased to 69.6% in 2012. While the percentage of individuals who mentioned that being healthy made them happiest was 72.8% in 2011, the percentage decreased to 70.8% in 2012.

Overall satisfaction level of individuals from public services has increased. When we look at the overall satisfaction level of individuals from public services, while satisfaction with social security, education, transportation, and judicial services increased in 2012 compared to 2011, satisfaction with health services decreased. Satisfaction with health services decreased from 75.9% in 2011 to 74.8% in 2012, 0.74% in 2013. The

level of satisfaction with public security services remained the same with the percentage of 79.4%. In addition, 76.6% of the individuals were hopeful about their own future. As seen in Figure 3, while the percentage of individuals who are hopeful about their own future was 75.2% in 2011, the percentage increased to 76.6%. While the percentage of females who are hopeful about their own future was 74.9% in 2011, the percentage increased to 76.9% in 2012. While the percentage of males who are hopeful about their own future was 75.5% in 2011, the percentage increased to 76.3% in 2012 (TurkStat, 2013).
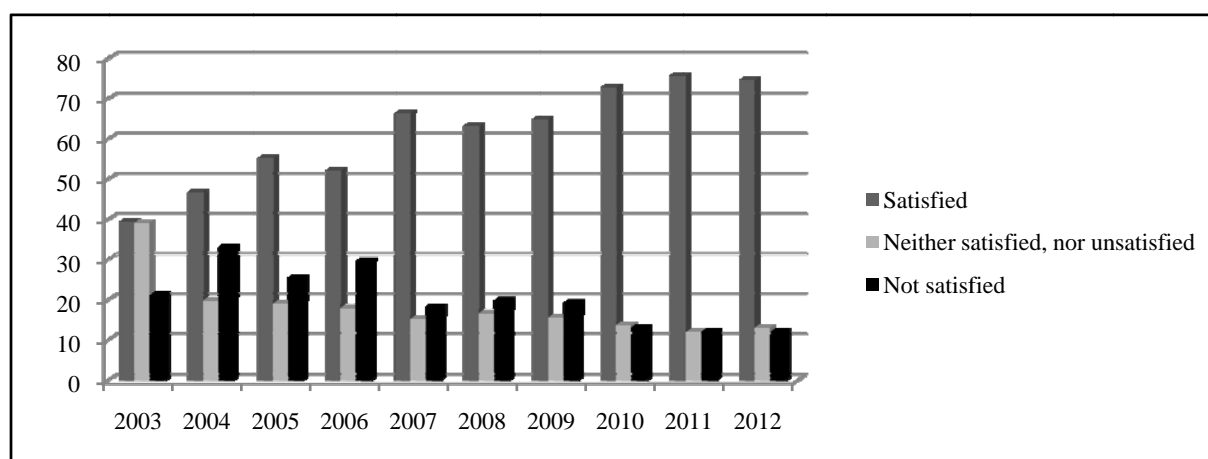

Figure 3. Satisfaction with public health services.

Research Findings

OECD governments pursue many health care objectives, including health care acceptability, accessibility, effectiveness, (cost) efficiency, equity, public satisfaction, quality of treatment, responsiveness to individuals' preferences, safety, sustainability, and timeliness. Data on public expenditure on health care, as well as the relevant social indicators, are available for Turkey in the period of 2003-2012. The dataset contains information on different groups of variables: public health expenditure, satisfaction with health service, and a set of variables that are known to affect the relationship between public health expenditure and outcomes.

Table 3

Changes in Indicators

Year	Change in satisfaction with health service	Change in annual public health expenditure	Change in annual public pharmaceutical expenditure	Change in annual number of doctors	Change in annual number of nurses	Change in annual number of other health care persons	Change in annual number of doctor consultations
2004	0.47	0.22	0.18	0.02	0.02	0.08	0.12
2005	0.55	0.12	0.08	0.02	0.03	0.01	0.25
2006	0.52	0.26	0.17	0.02	0.07	0.09	0.15
2007	0.67	0.15	0.1	0.02	0.11	0.22	0.17
2008	0.63	0.22	0.16	0.02	0	0.11	0.11
2009	0.65	0.14	0.24	0.05	0.03	0.04	0.1
2010	0.73	0.05	-0.05	0.08	0.07	0.07	0.02
2011	0.76	0.13	0.03	0.01	0.15	0.16	0.13
2012	0.748	0.07		0.01			-0.020
2013	0.747	0.19		0.005			0.010

This study examined various indicators to measure the efficiency of health expenditures. The following indicators are examined: annual public health expenditure, annual public pharmaceutical expenditure, number of doctors, number of nurses, other health care persons, and number of doctor consultations. Some indicators of health statistics are selected. Table 3 shows the selected indicators examined in the paper.

In the regression analysis, the relationship between some of the indicators in Tables 3 and 4 and satisfaction with health service has been identified.

Table 4

Satisfaction With Health Service and Changes in Basic Indicators

Year	Satisfaction with health service (%)	Change in annual public health expenditure (%)	Change in annual number of patients per doctors (%)	Change in annual number of doctor consultations (%)
2004	0.469	0.224888329	-0.009680451	0.125628141
2005	0.553	0.121464304	-0.004835634	0.245535714
2006	0.523	0.255513403	-0.00465324	0.139784946
2007	0.665	0.146566609	-0.003450827	0.147798742
2008	0.634	0.220938315	-0.008264023	0.073972603
2009	0.651	0.112218032	-0.038748048	0.086734694
2010	0.731	0.033951802	-0.063008137	0.021126761
2011	0.759	0.125778639	-0.000100408	0.144827586
2012	0.748	0.074386222	0.018776308	-0.020080321
2013	0.747	0.195821965	0.005694417	0.010245902

T-test and analysis of variance (ANOVA) have been conducted; however, the independent variables employed in the model were not statistically meaningful. Depending on the data set shown above, it is important to note that the multiple regression model was statistically successful as a whole to explain changes in the dependent variable as well as the regression statistics including *R*-square and the determination coefficient (see Table 5). Thus, simple regression analysis has been conducted to estimate the dependent variable.

Table 5

Regression Statistics

Statistic	
Multiple *R*	0.91235
R-square	0.832383
Adjusted *R*-square	0.813758
Standard error	5.362191
Observation	11

Table 6

ANOVA

	df	SS	MS	*F*		Significance *F*	
Regression	1	1,285.082	1,285.082	44.6937		9E-05	
Difference	9	258.7779	28.7531				
Total	10	1,543.86					
	Coefficient	Standard error	*T*-stat.	*P*-value	Low 95%	High 95%	Low 95%	High 95%
Intersection	35.00188	4.419541	7.9198	2.4E-05	25.00418	44.9997	25.00418	44.9997
X variable 1	0.000675	0.000101	6.685334	9E-05	0.000446	0.000903	0.000446	0.000903

The regression model is as follows:

$$\textit{Health Satisfaction Index} = \beta_0 + \beta_1 * \textit{Change in Annual Public Health Expenditure} + e_i$$

$$\textit{Health Satisfaction Index} = 35.0018 + 0.0006 * \textit{Change in Annual Public Health Expenditure} + e_i$$

As it can be seen from the descriptive statistics, there is a very strong and positive linear relationship between the dependent variable satisfaction with health care services and the independent variable public health expenditure per year. The determination coefficients known as R^2 and adjusted R^2 statistics are roughly at the desired level (above 80%), which shows that the model does fit quite well the data collected or observed. It can be suggested that the variation in satisfaction with health care services is supposed to be explained at a rate of 81% by the growing amounts of public health expenditure per year. Depending on the results in Table 6, the regression model is statistically significant to use the estimators. The intercept coefficients as well as the slope parameter in the regression model are statistically significant to be carrying out the estimation. All the p-values pertaining to the parameters have been found statistically meaningful for the estimative purposes.

The coefficient of the regression is consistent with expectations. Annual public health expenditure and health satisfaction level can be expected to have a positive relationship resulting in a statistical conclusion that an increase of $1,000,000 in public spending on healthcare is to be followed by an increase in index score by 0.07%.

R-square = 0.8323 means that 83.23% of the total change in health satisfaction index could be explained by change in public health care expenditure.

Adjusted R-square = 0.8137 means that 81.37% of the change in the satisfaction index could be explained by the change in public spending on health care services.

Health-related effects of the satisfaction index are supported by the following statistics: F = 44.6937 and p-value = 0.00009 for F-test.

One way of gauging the efficiency of health care expenditure is by estimating the contribution of health care expenditure to life expectancy, taking into account lifestyle and socio-economic factors. According to social indicators compiled by Turkey's statistics authority, the TurkStat in terms of health, life expectancy at birth in Turkey is 74 years; life expectancy for women is 77 years, compared with 72 for men. Average life expectancy in Turkey went up to 74 years from 70.9 years in the period between 2003 and 2012.

A health care system is efficient when an increase in expenditure results in significant improvements in the health of a population. We can say the relative efficiency of public and private health care expenditure in reducing infant and child mortality (Arslanhan, 2010). Infant mortality in Turkey decreased to 20.5 per thousand in 2009 from 25.6 per thousand in 2003. Infant mortality rate was 11.7‰ in 2011 and 11.6‰ in 2012. We observed an increase in health expenditure causing a decrease in mortality rates over the period of 2002-2012. We can say that increasing public health expenditure is both significantly correlated with a lower mortality and significantly more efficient in reducing mortality.

Public health expenditure to GDP ratio has increased in the period of 2002-2009. However, since 2009, the rate has decreased over the years. Despite this decline, the satisfaction with health care services has increased and decreased slightly in the last year.

Satisfactions with public services in general are given in Figure 4. Satisfaction with health care services has generally increased more than others in the period of 2003-2012.
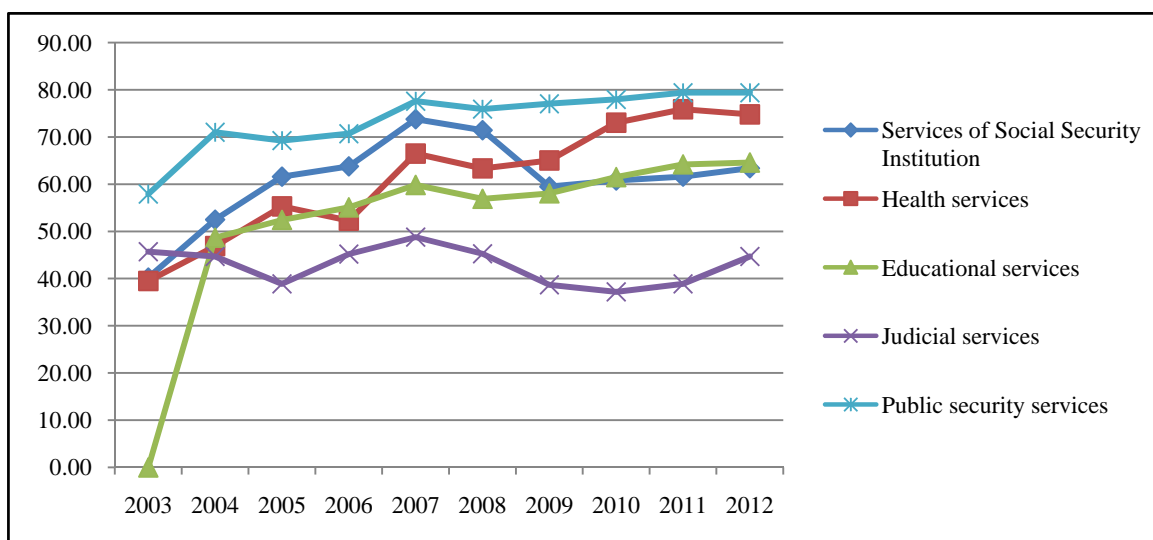
Figure 4. Satisfaction with public services in general. Source: LSS (TUIK).

The number of doctor consultations per patient has increased in the period of 2002-2011. In 2002, the number was 3.17 per person yearly and increased to 8.18 in 2011. The research results show that there is a relationship between the public health expenditures and doctor consultations. Figure 4 shows an increase in the patients' satisfaction level of public health care services. This increase supports the accuracy of the research results. The examination of persons was less than in previous years in Turkey, whenever they wanted. In the last 10 years, the number of doctors was adequate, although the number of examination rooms was less. The increasing number of examination rooms means that more examinations were performed. In this way, the number of doctors had not increased more, the number of doctor consultations doubled to about three.

As a result, public health expenditure is highly considered as a major driver in Turkey among the main indicators of health care satisfaction. In the period between 2002 and 2012, health expenditures in Turkey increased, life expectancy rose, and infant mortality rate reduced significantly.

Turkey still has very low numbers of health workers. Therefore, financial and non-financial incentives to increase the satisfaction and productivity of health workers are implemented, while at the same time, substantial investments are being made to increase the number of new graduates. The performance-based supplementary payment system for health workers in public hospitals is a cornerstone of such incentive schemes.

Most OECD countries have enjoyed large gains in life expectancy over the past decades, thanks to improvements in living conditions, public health interventions, and progress in medical care. Among OECD countries, Turkey registered one of the greatest gains in life expectancy between 1960 and 2010, with an overall increase in longevity of more than 25 years, rapidly narrowing the gap with the average across OECD countries. In 1960, life expectancy in Turkey was 20 years, below the OECD average. By 2010, it was 5.5 years lower (women 79.2 years and man 74.7 years in 2013 in Turkey, compared with the OECD average of 79.8 years).

In Turkey, a remarkable progress has been observed for health outcomes: Life expectancy, control of communicable diseases, and maternal and child mortality rates have improved significantly in the period of 2002-2012. There have also been significant improvements in coverage, particularly of preventive services.

Conclusions

Turkey's HTP has produced gains in the access to and quality of health services since 2003, leading to cumulative improvements in aggregate health outcomes. The family medicine model is already operational nationwide and Universal Health Insurance covers most of the population. Both internal factors (increased social security and health service coverage) and external factors will drive up health care costs in the coming years. Global expenditure caps have helped to contain health expenditure in the short term, but addressing the underlying drivers of health spending could further strengthen the long-term sustainability of the health system. To sustain high performance, the government is pursuing further reforms to increase the efficiency of health expenditure, including: a review of the basic benefit package, improvements to the current provider payment and cost containment mechanisms, strengthened pharmaceutical policies, hospital autonomy, and the introduction of incentives for family medicine providers.

Inclusion of health care expenditure in the national budget is one of the biggest challenges faced by public policy-makers, particularly for the developing countries. Although the ageing population, as an inevitable factor, is a significant determinant of how the future health care expenditure will develop (OECD, 2011), there are also some other relevant factors to be given serious consideration. Indeed, the other sides of supply and non-demographic factors are even likely to be more important than commonly-used demographic factors such as the population age.

Improvements in the efficiency of health care system management might be an alternative to be taken into account for the evaluation of health care expenditure. Accordingly, as a result of the potential for efficiency gains in this sector, public savings are higher for many of the developed countries.

In this study, the efficiency of public health expenditure has been examined based over the period of 2002-2013. The causal relationship between public spending on health and patient satisfaction with health care services has been measured and analysed. By the same token, the co-movement of an increase in health expenditure and public satisfaction has been studied to a particular extent which has brought us to a conclusion that patient satisfaction is positively well related with the annual health expenditure.

Improving health care system management efficiency may be an alternative to be taken into account in containing health care expenditure in Turkey. Furthermore, there is a significant relationship between various health care policies and institutions and the levels of efficiency of health care systems. However, the levels of efficiency estimated for the different countries, and as a consequence of the role of regulatory policies in their improvement, are significantly affected by the methodology used.

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