

CANCER EXPENDITURES IN TURKEY

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As it is all over the world, cancer is a significant health problem in Turkey. According to the results of the Disease Burden and Cost Effectiveness in Turkey research, after cardiovascular diseases, cancer is the second cause of overall deaths in Turkey (the Ministry of Health, 2004a). The estimates indicate that cancer incidence will continue to be high in the following years, and in the foreseeable future it will become the first cause of death. Among the main reasons of this trend, the high rate of smoking in Turkey, negative factors in relation to the environment, negative nutritional factors and other risk factors can be addressed. Furthermore, the aging of the population is also an important cause in the increase of cancer frequency and mortality due to cancer.

A significant outcome of the increase in cancer incidence is the increase in economic load of the health sector and the country because of this disease. It is well-known that diagnosis and treatment of cancer requires high medicinal technology, which in turn leads to an increase in health expenditures and the pressure on social resources. Moreover, not only diagnosis and treatment, but also the programs developed for preventive purposes require significant amounts of resources. Today, either in developed or in developing countries, a crucial fact every society is faced with is that health expenditures rise rapidly and it takes a gradually increasing share from the economic wealth of nations. Financial and other pressures on health systems have brought the issue of change in every society. The health reform movement, which has been on the agenda since early 1990s at global scale, also affected Turkey, and efforts of reform were launched starting from 1993, when the “National Health Policy” (the Ministry of Health, 1993) was published. The reform proposals in Turkey have developed within the framework of global reform proposals and the major themes of reform have been the

separation of the delivery and financing of health services, expansion of the health insurance coverage so as to include every individual living in the country, developing the family physician system in order to strengthen the primary health care services and providing autonomy to hospitals in secondary and tertiary health care services. Although there had been reform attempts in the health sector in the last 15 years, more concrete steps on the matter have been taken since 2003 and changes, which significantly affect the delivery and financing of health services and the access of citizens to these services, have taken place. However these developments also triggered the increase in health expenditures and the control of expenditures has started to occupy a larger place in the agenda of policy makers.

In conjunction with the process started in the health sector in 2003, Turkey is expected to witness crucial changes in the coming years. This transformation will inevitably lead to an increase in health expenditures and the need to use scarce resources as efficiently as possible. The expectation of increase in the cancer incidence also gives rise to the expectation of increasing expenditures made in relation to cancer. This paper focuses on cancer expenditures. In the second section, cancer expenditures in the world and the discussions on these expenditures will be addressed. In the following section, health and cancer expenditures in Turkey will be addressed and the difficulties, which arise in the calculation of cancer expenditures, will be discussed. In the fourth section, the data collected in relation to cancer under the project of “Developing Infrastructure for Strengthening and Restructuring the Health Services Financial Management” carried out by Hacettepe University on behalf of the Ministry of Finance, the Ministry of Labor and Social Security and the Ministry of Health, and the ways to utilize these data in the determination of expenditures in the following years will be addressed, and in the last section the results and proposals derived from these discussions will be put forth.

Cancer Expenditures in the World

The expenditures made for the diagnosis and treatment of cancer constitute a significant portion of health expenditures in all countries. The main reasons of this situation are the aging of world population and the increase in cancer risk due to aging; increase of the chance of treatment by early detection due to the recently developed diagnosis methods, however causing individuals to live with cancer for longer periods as the life expectancy also increased; the development of new, more effective, but more expensive treatment methods; and as a result of the rapid

dissemination of information on such new methods, the increase in the pressure exerted by patients and their relatives for the use of such methods. But, one of the most important problems every society is faced with, is the scarcity of resources and the necessity to ensure the most rational use of available resources leads to questioning the expenditures made in relation to cancer, as in other expenditures made in the health sector, and initiation of multidimensional studies in this field. In this section, the magnitude of cancer expenditures at global scale and the discussions regarding this issue will be addressed. But before going on with the discussions on the subject matter, we need to make an explanation on the data of health expenditures and the expenditures made for a disease within these expenditures.

One of the most important conditions to develop a good health policy in a country is to identify health expenditures in aggregate and according to the origin, the service provider, the type of health service delivered and, finally, the diseases. The data on health expenditures should be collected and analyzed in a manner to allow both the guidance of the policies to be developed and the monitoring of a policy put into practice. In order to be able to assess different outcomes of various practices and also to compare international results, it is crucial to collect the data by a similar methodology and conceptual framework in each country. The OECD System of Health Accounts (SHS) (OECD, 2000), which is developed and employed by most of the member states to this end, helps both to ensure various countries to get together in a common framework and to provide comparable data between nations. Health expenditure accounts in compliance with the SHS were developed in Turkey in 1999 and 2000, but this study could not be carried on due to various reasons (the Ministry of Health, 2004b). This subject and the problems related to the data on health expenditures in Turkey will be addressed in next section. But a crucial point, which must be emphasized here, is that, keeping the account of expenditures in relation to disease is utterly difficult and could, indeed, be accomplished only by a limited number of countries. In order to be able to calculate the expenditures made in relation to a certain disease, both the data concerning the disease and the data concerning expenditures must be accurately known. Especially, if the prices of health services do not reflect the true costs, these expenditures can be calculated only by means of special inquiries. Hence most of the data on cancer expenditures originate from the United States of America (USA), where the data on health expenditures can be

collected better and prices reflect true costs. The table on the distribution of expenditures within the OECD SHS in terms of disease types can be made available only by a small number of countries. Therefore the examples given below are mainly in terms of the cancer expenditures in the USA.

According to the 2004 report of World Health Organization (WHO, 2004), 12.5% of global mortality is due to cancer and cancer constitutes 5.1% of global disease burden. The distribution of mortality and disease burden between cancer types are presented in Table 1.

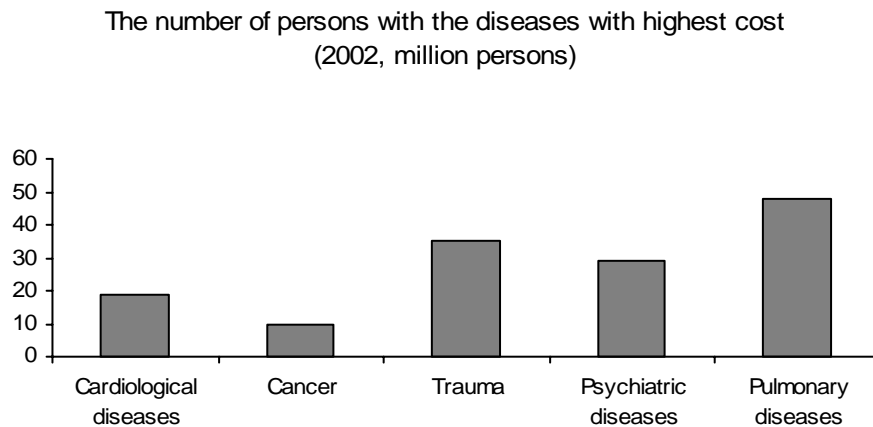
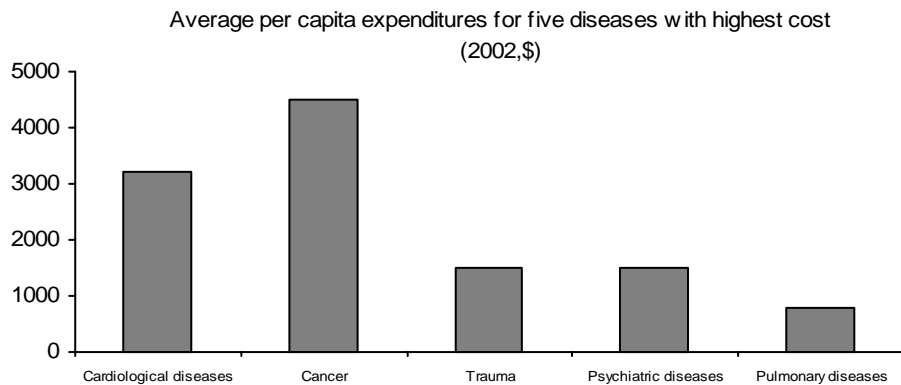
Table 1: Global Cancer Burden

	% of global mortality	% of global disease burden
Cancer	12.5	5.1
Lung	2.2	0.8
Stomach	1.5	0.5
Colon/Rectum	1.1	0.4
Breast	0.8	0.4
Leukemia	0.5	0.3
Prostate	0.5	0.1

Source: WHO, 2004

As mentioned above, cancer is a disease, the diagnosis and treatment of which is expensive. Therefore the financial burden of the disease can be greater than the general burden of it. For example Figure 1 compares five diseases with the highest cost in terms of expenditures made and the prevalence of the disease. As illustrated in the figure, although the first five diseases with the highest cost in the US are cardiological diseases, cancer, trauma, psychiatric diseases and pulmonary diseases, cancer takes the first place when compared in terms of per capita health expenditures.

Figure 1: The prevalence of five diseases with the highest cost and per capita health expenditures in the US



Source: Journal of the National Cancer Institute, 2005

Even though cancer is still the second highest cause of death in the US, considerable decline in the cancer mortality rates has occurred since 1990 (Figure 2). Such decline is mainly due to the fall in the mortality caused by breast, prostate, lung and colorectal cancers, which are the most frequently observed cancer types in males and females. Lung cancer still occupies the first place among these, with 56.2 deaths per 100.000, and the greatest reduction is observed in prostate cancer. Prostate cancer mortality has fallen by 25%, from 38.4 to 28.7 per 100.000 between 1990

and 2001 (Pfizer, 2003). Among the main causes of this case, we can mention the positive developments experienced in the reduction of risks, especially in relation to smoking, the development of new diagnosis and treatment methods, and the rise of early diagnosis possibility. \$72 billion is spent to the diagnosis and treatment of cancer in the US. The share of cancer expenditures in total health expenditures is 4.7% (Bosanquet, Silora, 2004).

The expenditures made for cancer treatment exhibit significant variation according to the cancer type. Table 2 presents evidence from the US on this issue.

Table 2: Expenditures on the treatment of frequently observed cancer types in the US

Type of cancer	% in new cancers	Expenditures (billion \$)	% in total cancer expenditures	Average per capita Medicare expenditure
Breast	18.2	5.4	13.1	9 230
Colorectal	11.7	5.4	13.1	21 608
Lung	12.5	4.9	12.1	20 340
Prostate	13.6	4.6	11.3	8 869
Lymphoma	4.2	2.6	6.3	17 217
Urinary bladder	4.0	1.7	4.2	10 770
Cervix	2.3	1.7	4.1	1 083

Source: Bosanquet, Silora, 2004

As shown in the table, the most frequently observed and the highest cause of mortality are colorectal cancer and lung cancer, which also are among the cancer types with the highest treatment cost. Therefore the prevention of these two cancer types would affect cancer mortality rates considerably and positively contribute to the reduction of the pressure on health expenditures as well. Another important aspect of the discussions on the expenditures made for a disease is to identify the type of health care for which these expenditures are made; in other words, to identify on which health function these expenditures are made. Table 3 presents the distribution of expenditures made for colorectal cancer, breast cancer, lung cancer and prostate cancer in terms of functions.

Table 3: The distribution of expenditures made on selected cancer types according to functions

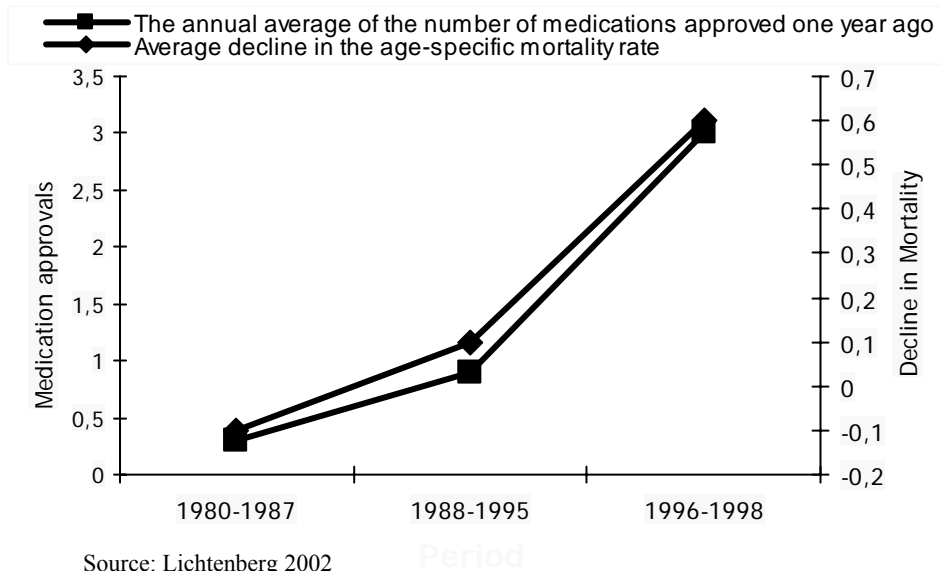
Cancer type	% Distribution of health expenditures over functions			
	Hospitalized patients	Out-patients	Prescribed medications	Health care at house
Breast cancer	29.1	63.3	7.5	0.1
Colorectal cancer	70.4	20.1	1.9	7.6
Lung	36.3	56.5	3.9	3.4
Prostate	44.1	46.8	8.0	1.1

Source: Pfizer, 2003

As seen in the table, the expenditures on hospitalized patients are generally made for colorectal cancer, which is followed by prostate and lung cancers. The expenditures on breast cancer are generally made on out-patient health services, while the greatest expenditures on medications are made on breast and prostate cancers. It is known that the US health system is based on the principles of private health insurance, but every citizen older than 65 years of age achieve the right to be covered by a Federal program, i.e. the Medicare. Cancer expenditures and the control of these expenditures are important for this program, which basically includes old population under its coverage. Among the main reasons of this phenomenon, the fact that cancer recovery rate has increased three times in the last 30 years, and that the survival rate of a patient diagnosed as cancer was 64% in 1995-2000, while it was 50% 30 years ago (Okon, Ogle, 2004) are mentioned. In view of these developments, cancer is anticipated to be classified under the status of “chronic disease” in the future and Medicare health expenditures to become a severe social problem because of the old population. The expenditures made on cancer medications in the Medicare have increased 33% between 1998 and 2002. The increase was 41% for 2001-2002. It is claimed that the main cause of the increase is the provision of new medications to the use of patients. Furthermore, the increase in medication doses, the use of supplementary medications, the prices of medications and the number of cancer patients also reinforced this trend. Therefore a pressure to put the expenditures made especially in relation to cancer medications under control has emerged in the last few years (Okon, Ogle, 2004). However the researches carried out lad down that despite being expensive, the use of new medications yield in positive outcomes both for the patient and the health system since they ensure longer lifetime, higher efficiency (increase in the capacity to work), higher quality of life (less constraints on activities) and lesser utilization

of hospitals and other medical services. For instance, a new medication developed for the treatment of breast cancer prevents 500 deaths due to this disease; in other words it prevents the loss of 5000 life years annually (Lichtenberg, 2002). Figure 2 illustrates the relationship between the approved new breast cancer medications and mortality due to this disease.

Figure 2. The approval of breast cancer medications and the decline in mortality



On the other hand the economic problems of health systems require taking cost effectiveness criterion, besides quality, medical effectiveness and safety criteria, into consideration in making the decisions especially on the repayment of health technologies. In the following years, the most important problem the health systems in both developed and developing countries will be facing with is going to arise around how to make repayment decisions.

As mentioned before, the increase in cancer incidence, the considerable place cancer expenditures occupy in the economies of nations and the issue how new technologies will be repaid is a problem not only of the US, but also of, though at different degrees, all other countries, both developed and developing. This case will be an important one also for Turkey, though it has not been discussed in detail yet. Next, we will first focus on the health expenditures in Turkey, then on cancer expenditures based on available data.

Health and Cancer Expenditures in Turkey

Before going on with the analysis of cancer expenditures, we should elaborate on the general structure and basic problems of health expenditures in Turkey. As mentioned above, Turkey could achieve health expenditures data comparable to international data only by 1999 and 2000. The study on National Health Expenditures (USH) in compliance with the OECD SHS was conducted for 1999 and 2000, and Turkey achieved comparable and detailed health expenditures data for these years (the Ministry of Health, 2004b). This study clarified many issues regarding the Turkish health sector interpreted on assumptions up to that date and also led to the examination of accepted facts for many data. It provided crucial evidences for the new health policies, which were attempted to be formed intensely at the period. The most important of these is related to the amount of health expenditures in Turkey. The researches carried out on health expenditures until 1999 laid down that these expenditures have approximately been 4-5% of the Gross Domestic Product (GSYIH). But the USH clarified that the share of health expenditures was 6.6% of the GSYIH in 2000. The most important effect of this outcome was that, it led to the questioning of the argument "Turkey is not allocating sufficient resources for health". It is put forth that, in view of her level of development, Turkey allocates a significant portion of its economic wealth to health expenditures, and she is occupying a high rank in the distribution of health expenditures among middle income countries, i.e. countries that are comparable to Turkey. Thus, as health indicators and the satisfaction level of the parties involved from the health system is evaluated along with the allocated resources, it can be claimed that "the efficiency of resource allocation and utilization" is a more indispensable problem than increasing expenditures. In other words, Turkey should examine how to utilize the available resources more efficiently, instead of the amount of resources allocated for health. Besides many evidences of the USH study, those mentioned below have made important contributions to the course of health policy development (the Ministry of Health, 2004).

The coverage of social security is lower than the recognized level: The official data of 2003 indicated that 80% of the population has health insurance. But the Utilization of Health Services by Households and Health Expenditures research conducted in the same year within the scope of the USH study pointed out that this ratio was 67%. A similar ratio was also introduced by the household survey carried out under the Disease Burden Study in the same period. Later, another study carried out by the State Planning Organization yielded in similar results. The main problem emerges as a result of the method used to calculate the number

of those, who benefit from health services as dependents of persons that have health assurance. This fact played a major role in the General Health Insurance reform attempts, which were intensely debated especially in the mentioned period.

Under-insurance is a significant fact: If the individual has health assurance, but he/she has to pay for the expenditures of health services from his/her own budget because of difficulties in accessing the insurance, we say that the individual is under-insured. Both in the household survey conducted within the scope of USH and in another study carried out to determine informal payments to health services (Tatar et al., 2007) it is found that the issue of under-insurance reaches a considerable extent in Turkey. Especially members of the Social Insurance Institution (SSK), the Social Security Organization for Artisans and the Self-Employed (BAĞ-KUR) and Green Card holders make a considerable amount of health expenditures from their own budgets due to various reasons, although they have a health insurance.

Out-patient health services are mainly provided by the private sector: Contrary to the case in almost all OECD countries, health expenditures are generally made for out-patient services instead of hospitalized patient services in Turkey, and these services are mainly provided by the private sector. One of the major reasons of this case is that, in Turkey physicians can work part-time in their own clinics and the need to consult these clinics before using public services has been adopted as a norm by the society (Tatar et al., 2007).

Retail purchases of medications are a major expenditure for households: A substantial amount of the expenditures made from the budget of individuals consists of medication purchases from pharmacies. One of the most important reasons of this fact is that medications are very quickly and easily accessible in Turkey. A crucial result revealed in the household survey of the USH is that 30% of Turkish population prefers to use drugs on his/her own when a health service is required. Obstacles in accession to health services and, on the contrary, convenience of purchasing medications from the pharmacy without any prescription led self-treatment to become a significant issue in Turkey. It is necessary to take the negative effects of this fact into account especially for diseases, which require early diagnosis such as cancer.

Even though there was a definite commitment at the mentioned period to conduct the USH study every year and the task was delegated to the Turkish Statistical Institute (TUIK), these studies have not been repeated since 2000. The estimates on health expenditures have been formed by aggregation of treatment and medication costs in the public sector and utilizing the estimations of private sector expenditures based on certain assumptions since then. However, as it is well-known, reforms,

which are expected to change access to and the use of health services considerably, were implemented since 2003. Among these reforms, the most important are, the transfer of SSK hospitals to the Ministry of Health, thereby expanding the accession coverage of SSK patients to the services, the regulations allowing SSK members to get their prescribed medications from any pharmacy, the expansion of the scope of the Green Card from being valid only for hospitalized patient services to being valid for out-patient services also, and adoption of performance based payment system in health services. Since there is no research assessing these policy changes, which substantially affected the access to and use of health services, therefore health expenditures, it is not possible to keep track of the changes especially in the structure of health expenditures. Like its impacts on all other disease groups, it is expected that these changes also have significant contributions to the early diagnosis and treatment of cancer. It is possible to observe the effect of these policy changes in relation to the increase in total health expenditures. As shown in Table 4, total health expenditures in Turkey for 2005 is estimated to be 37,027 billion YTL. The share of health expenditures in the GSYIH in the same year was realized as 7.6%. The share of public health expenditures in total health expenditures increased in 2000-2005 period, whereas the share of private health expenditures decreased as shown in the table and as expected.

Table 4: Health Expenditures in Turkey

Health expenditures	2000	2001	2002	2003	2004	2005
Total (million)	8,248 ¹	13,337 ¹	20,450 ¹	27,259 ¹	33,005 ¹	37,027 ²
Share in GSYIH (%)	6,6 ¹	7,5 ¹	7,4 ¹	7,6 ¹	7,7 ¹	7,6 ²
Per capita (YTL)	122 ¹	195 ¹	295 ¹	385 ¹	460 ¹	514 ²
Public expenditures (%)	62,9 ¹	68,2 ¹	70,4 ¹	71,6 ¹	72,1 ¹	71,4 ²
Private expenditures (%)	37,1 ¹	31,8 ¹	29,6 ¹	28,4 ¹	27,9 ¹	28,6 ²

¹ OECD, 2006

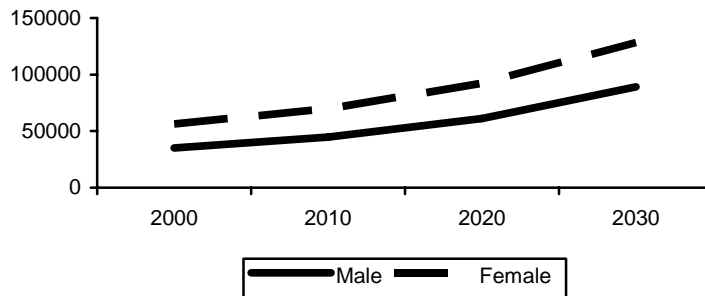
² www.who.int/nha/country/TUR.xls

Before going on with the discussions on cancer expenditures in Turkey, it is necessary to present the theoretical debates on the identification of expenditures made in relation to any disease in a health system. As health economics has not been developed sufficiently in Turkey, a substantial conceptual confusion appears regarding the concepts of health economics. Such confusion emerges sometimes in relation to the concepts of expenditures and costs, and these two concepts are used in a manner to substitute one another. In the simplest sense, expenditure implies the nominal value paid in return for a commodity or a service. This return may not reflect the true value of the commodity. Especially when there are subsidies and the price of the commodity or the service is not determined according to the free market conditions, the price of the commodity or the service does not reflect the actual cost of it to the society. Subsidies hamper the possibility to reveal the full value of the commodity/service. Therefore, if the price of a commodity or a service does not reflect the true value of that good or service, it will be incorrect to start from the price in calculating the “expenditure”. In other words, for instance, in calculating the expenditures in relation to cancer the amount of expenditures calculated as the sum of the prices of resources used in the course of diagnosis and treatment (the invoice total) does not reflect the true value of the resources used for the disease. In Turkey, as is known, the prices of services, which are repaid, are determined by the Budget Implementation Directive issued every year by the Ministry of Finance. In determining the prices of these services, the Ministry does not rely on cost accounting, but takes the inflation rates of the previous year as the basis of a price increase in the current year. Hence, for the health sector, in calculating the expenditures on some disease or health function, it would not be correct to start from direct prices and bills. For example, in the abovementioned NSE study, in order to calculate health functions such as out-patient services or hospitalized patient services, a cost accounting study was carried out on a sample of hospitals representative for Turkey.

Another important point worth to mention in this aspect is that, determining the expenditures made for a particular disease is a difficult task for any country. Besides the need to have prices reflecting the true costs of expenditures and the availability of accurate information on expenditures, the data on the frequency of the disease in the society should also be accurate. It is mentioned above that, in Turkey, the data on expenditures do not reflect true costs, therefore true expenditures. Likewise, there are question marks concerning the availability of accurate and reliable data on cancer incidence, prevalence and mortality. According to WHO statistics, in Turkey, the cancer mortality rate

standardized in terms of age was 95 per 100,000 in 2002 (WHO, 2006). According to the Disease Burden study carried out in 2000, cancer appeared to be the second cause of death after cardiovascular diseases. In the same study, according to the projections made, it is anticipated that mortality due to cancer will continue to rise in the following years (Figure 3) (the Ministry of Health, 2004a).

Figure 3: Deaths due to cancer and mortality projections

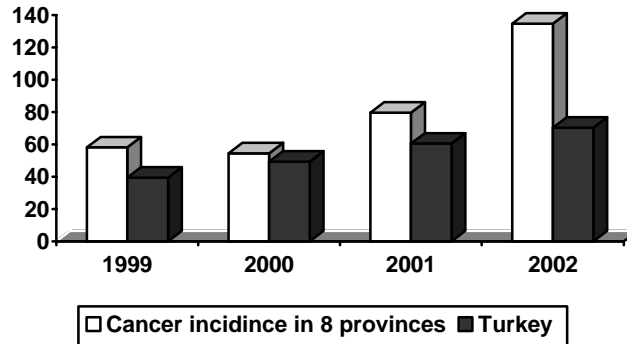


Source: The Ministry of Health, 2004a

But a crucial issue that should be underlined is the significant problems regarding the registries of causes of death in Turkey. As is known, it is compulsory to have a physician identify and record the cause of death. However, there are studies questioning the reliability of these registries. For example, in a study conducted by Etiler et al. (2005) the causes of death communicated by Kocaeli University Hospital to TUIK are compared to the causes in the patient files. Consequently it was found that 68.3% of the causes of death were not recorded correctly. The existence of such a large deviation in the causes of death communicated by a university hospital leads to question marks on the causes of death, which happen outside the hospital and the rank of cancer in the list of death causes.

Besides the registries of causes of death, there are also substantial problems in the reliability of cancer registries. Figure 4 compares cancer incidence in Turkey and cancer incidences according to the registries in 8 provinces, where there are Cancer Registry Centers.

Figure 4: Cancer incidences in Turkey and the provinces, where there are Cancer Registry Centers



Source: The Ministry of Health Department for Cancer Combat

As shown in the figure, there are significant differences between the incidences of the centers, in which cancer registries are more reliable, and the general registries. Hence in calculating cancer expenditures in Turkey, the problems in the data on cancer frequency can cause the cancer expenditures to be estimated lower than its true value.

The Cost of Cancer Treatment in Turkey

As mentioned above, the detection of expenditures on a disease requires the analysis of costs regarding that expenditure. Cost information is a tool serving to specific purposes. In general, cost is the nominal sum of sacrifices made in order to achieve the targeted outcome. Costs can be calculated in different ways depending upon the objective of aggregation. Research on disease costs are descriptive studies. In any disease cost study factors such as the way of drawing up cost accounts, the specification of which cost categories to include and the agent according to whom the accounts are prepared are utterly important. Although there are different ways to define costs, in general they are classified as direct and indirect costs. Direct costs include costs based on “operating resources” such as primary material and equipment of health services, labor costs and general production costs. Indirect costs, on the other hand, reflect “forgone resources” such as loss of output due to morbidity and

mortality. Implicit costs, in turn, depend on facts, which cannot be defined in physical units, such as suffering. The cost of a disease, in fact, implies the costs born as a result of the taken action for the treatment of the disease. For instance, when we say the cost of cancer, we mean the “cost of purchase” in case the outcomes of the treatment activity regarding cancer are purchased, and the “production cost” in case the outcomes are achieved by production. Thus, the cost of a disease varies according to the health service providers, the social security institution purchasing the service or the person making direct payment. In the former case, costs will be measured by the sacrifice due to production activity, whereas in the latter they will be measured by the sacrifice due to purchasing activity.

There is no study available in Turkey to determine expenditures and costs of a disease in the mentioned framework. The disease based expenditure table, which is one of the nine tables, provided within the framework of the USH was not drawn up by taking the causes summarized above into consideration. Yet, a crucial point worth to mention is, such a table is very difficult to draw up also for most of OECD, or other, countries. The literature review on the subject provided us the information that, cancer expenditures were forecasted on the basis of the records of 83 patients, who died of lung cancer at a university hospital in 2004. But expenditures were obtained from invoice information and the true cost of the disease was ignored in the mentioned paper. Therefore, it is not possible to consider the results of the study as cancer expenditures and accept that these figures reflect cancer expenditures in Turkey. In the paper, per capita health expenditure for the treatment of lung cancer is estimated as \$8257 (Esin et al., 2004).

As pointed out in previous sections, since 2003 Turkey has been going through a series of practices summarized by the title of “Restructuring in Health”, which envisage performance in health services, service efficiency, and measurability and auditability of service quality. Possible outcomes of certain projects carried out in regard to the transformation program of the health system might enable studies on cost accounting per case in the near future. Especially the regulations on financing the services will change the configuration of health services in coming years. The General Health Insurance will purchase health services through contracts made with institutions, which compete with each other. These contracts will include the prices of provided services, as well as their quality. In the long-run, since the elimination of subsidies is expected, the prices of services will reflect the true costs. Such new approaches to the provision and financing of health services necessitates,

on the one hand, detailed statistical studies and cost analyses on the subject to be carried out and, on the other hand, for realistic budgeting to be possible, the development of control systems, which will enable the estimation of change in health expenditures in years. Scientific research to be conducted within this context requires the collection of a series of data and carrying out operational cost analyses on coding, classification and health services based on these data.

The Social Security Institution (SGK) Directorate launched an application called “MEDULA” in order to enable electronic communication of the information on the health services provided by health services providers to the persons regarded as insured under the scope of Law No. 5510 on Social Insurances and General Health Insurance and the dependents of these persons. Pursuant to the communiqué issued in the Official Gazette No. 26369 of 1 December 2006 with Serial No. 1, the SSK obliged the integration of all Public and University Hospitals and private health institutions—regardless of whether these hospitals or institutions have a contract with the Institution— which submit invoice, to the MEDULA system that enables the electronic incorporation of diagnoses, examinations and treatments of health services providers by means of a simple, general and valid communication standard, and started its implementation with a Communiqué issued on 16.04.2007. MEDULA is an integrated system established between the Social Security Institution and hospitals in order to collect invoice information electronically and make the repayment in this framework. By means of the application organized as four main web services, transactions of benefiting, referral, prescription, examination demand, disbursal search and billing (also sending the invoice information electronically) are carried out. Through MEDULA it is possible to track all health service uses of a patient. On the other hand, with this system, it will also be possible to monitor and guide the use of health services in terms of both patient flows and the content of the services provided. By means of this system it is also possible to keep track of functional expenditure parameters, which are not yet included in processes, such as medication and medical equipment information on patient and diagnosis bases, patient hospitalization information, examination and radiology information, information on tests. Furthermore, when the parameters, which are not yet included in processes, are actuated, it will also be possible to monitor state parameters such as chemotherapy and oncologic cases in all branches. When the General Health Insurance become effective legally, it will be possible to monitor functionally all public expenditures on health in the electronic environment. It will be possible to keep track of public health expenditures made by SSK to purchase health services from health services providers according to function and diagnoses, except for direct

health expenditures made by individuals and informal payments. Thereby it will be possible to observe the magnitude of expenditures made for diseases, which are important in view of disease and expenditure burden, such as cancer, and to provide more rational choices on the performance of the system to decision makers so as to enable them to set certain priorities.

Within the framework of the restructuring in the social security system, the accommodation of prepayment systems such as fee per case, which ensure foreseeable, manageable and effective costs control instead of the present fee-for-service system, which does not employ scarce resources in an objective and fair way and include factors that encourage inefficiency and waste, are considered as a necessity for sustainable financing. Pursuant to this conception, a project called “Developing Infrastructure for Strengthening and Restructuring the Health Services Financial Management” carried out by Hacettepe University on behalf of the Ministry of Finance, the Ministry of Labor and Social Security and the Ministry of Health was launched in 2005. The project is formed of components on the restructuring of the fee-for-service system based on the Budget Implementation Directive (BUT), which is already operational, developing prepayment and budgeting per case system based on Diagnosis Related Groups (DRGs) in the payments of health services delivered to hospitalized patients and developing an infrastructure for medications and medical equipment. In order to ensure transition to a prepayment system based on Diagnosis Related Groups, DRG pilot studies were commenced in 8 hospitals among which 1 is private, 2 are university and 5 are Ministry of Health –general and training– hospitals, and the studies for 7 hospitals, except one university hospital, are completed. In 2006, in order to provide the information necessary for the management of health services, in view of the achieved results, a management information system, which will allow developing the per case payment system based on National DRG, and collection and analysis of data, was established according to the regional and ownership characteristics of the project and the properties of the hospitals, based on Turkey-sample which consists of 48 hospitals, and with a sample size covering 20% of all hospitalized-patients; the scope of the project called HUAP 2, which will continue until 2009, is expanded by a Supreme Planning Council decision.

The main purpose in establishing DRGs, which were developed by researchers in Yale University in 1970s and started to be applied in the US in 1983, is to identify the case types regarding hospitalized patients, who are expected to purchase similar services from any hospital. As a

hospitalized patient classification method, DRGs provide ways of associating situations, which threaten the hospital due to the expenses incurred, with patient types or patient types with the resources of treatment expended by the hospital after the classification of patients in terms of diagnoses. There are two components of DRG-based financing. The first of these is identification, which consists of the coding and grouping of patients treated by hospitals and the collection and analysis of data regarding these, and the second component is designation of costs, which includes the calculation of the costs of cases taking treatment and its analysis. For DRG, in principle, accurately and completely collected clinical and cost data at the patient level are required. In order to establish DRGs, both accurate medical data and the definitions of diseases at the patient level should be provided. DRGs, which enable measuring clinical activity, to understand which type of patients are treated by whom and establishing data standards for assessing clinical performance, are accepted as a system that ensure equitable, fair and transparent allocation of scarce health care resources to service providers if used with appropriate financing rules. Today, the case mix model developed for hospitalized patients on the basis of DRG constitutes the foundation of the studies carried out for transition to the per case payment system, which allows distribution of financial risks between institutions providing health services and is increasingly implemented in developed countries such as the US, Canada, Germany, France, Italy, Spain and Australia.

The Ministry of Health Department of Cancer Control needed to anticipate the expenditures made for this disease in order to use it as data in its policies regarding the cancer disease. Since currently it is not possible to determine the expenditures and costs regarding the disease from any other source, the distribution of the cost elements of diagnosis groups on diseases and efforts related to cancer are requested from the clinical costing studies and diagnosis-based groups carried out in 7 hospitals within the scope of HUAP project and the assessment results on the conditional values of possible variance between hospitals are asked to the research group. The data achieved in this way consist of DRG hospitalized patient costs, which are drawn up according to the main cost items for cancer cases. The data from the 7 hospitals within the scope of research for the first 9 months (January-September) of 2006 on the diagnosis related group costs and conditional values of patients hospitalized with the diagnosis of cancer according to ICD 10 AM codes are presented in Table 4. The names of the hospitals included in the sample in the research are not given due to confidentiality principle and

no inter-hospital comparisons are made. DRG groups including cancer patients are defined in terms of their codes and explanations, and the number of discharged patients, number of patient days, average number of days of staying in hospital, and patient and patient day costs are given for each DRG group for the 9 months in 7 hospitals. Even though it is possible to make cost comparisons between hospitals and interpret the possible sources of possible variation, results in this context are not given here. The results in Table 4 are particularly given for the purpose of assessing the average outcomes of diagnosis related grouping, which is carried out for a single disease. In view of this, we comprehend from the nine months data achieved from the hospitals within the scope of research that, 5469 cancer patients took hospitalized treatment, stayed 11.9 days on average in the hospital with a cost per patient day equal to 274 YTL and cost per patient equal to 3261 YTL. Despite the limited scope of the research, when we evaluate each DRG group in terms of conditional values, which indicate the weight of its relative cost in the mean cost, it becomes possible to observe the variation between costs in relation to cancer types. As shown in Table 4, some DRGs consume fewer resources than average, whereas for some cancer types costs exceed the mean by almost 28 times.

Theoretically the DRG cost outcome tables enable managers to monitor detailed activity-based cost elements with respect to expenditure centers and provide them the basic information needed for cost control and success evaluation by analyzing the deviations, which are observed by comparing these cost elements with cost standards, in terms of their causes. However the results presented below do not allow rational evaluation and reflect the hospital full costs of the hospitalized patients taking treatment, since the data is not appropriate for inter-hospital comparisons as they cover only hospitalized patients, but not out-patients and daily hospitalizations in these hospitals during the 9 months in question and as most of the medications and medical equipment needed by cancer patients taking chemotherapy are provided externally. Therefore, these constraints must be taken into account in the interpretation of the research results. The research results do not include an assessment in terms of efficiency. But in the near future it will be possible to monitor the service costs of health service providers in case the fee-for-service model of the social security system is substituted by the DRG-based fee per case model for hospitalized patients.

Table 4: Cancer cases in 7 hospitals in Turkey, costs and relative values of diagnosis-related groups in hospitalized patients

DRG Code	DRG Explanation	Conditional Value	Number of Discharged	Number of Patient Days	Average Number of Days in the Hospital	Average Cost of Patient	Cost of a Patient Day
B66A	Neoplasm, with Catastrophic/severe CC (Comorbite Complication)	1,38	10	90	9,00	4.516	502
B66B	Neoplasm, without Catastrophic/severe CC	0,89	264	2.446	9,27	2.904	313
D02B	Head and Neck Procedures, with Malignancy or Moderate CC	5,06	43	1.089	25,33	16.496	651
D02C	Head and Neck Procedures, without Malignancy or Moderate CC	0,96	68	804	11,82	3.119	264
E71A	Respiratory Neoplasm, with Catastrophic CC	1,27	8	129	16,13	4.140	257
E71B	Respiratory Neoplasm, with Severe/Moderate CC	1,39	36	545	15,14	4.549	301
E71C	Respiratory Neoplasms, without CC	0,72	429	3.806	8,87	2.352	265
G03A	Stomach Oesophageal and Duodenal Procedures, with Malignancy	1,07	159	2.842	17,87	3.479	195
G60A	Digestive Malignancy , with Catastrophic/Severe CC	2,54	20	322	16,10	8.278	514
G60B	Digestive Malignancy without, Catastrophic/Severe CC	0,45	492	4.252	8,64	1.471	170
H02A	Major Biliary Tract Procedures with Malignancy or Catastrophic CC	1,04	15	365	24,33	3.391	139
H61A	Malignancy of Hepatobiliary System Panc (Age > 69 with Cat or Sev CC) or with Cat CC	17,36	2	66	33,00	56.620	1.716
H61B	Malignancy of Hepatobiliary System Panc (Age > 69 without Cat or Sev CC) or without Cat CC	0,41	178	1.308	7,35	1.336	182
I65A	Connective Tissue Malignancy including Pathological Fx with Catastrophic or Severe CC	8,27	7	89	12,71	26.982	2.122
I65B	Connective Tissue Malignancy including Pathological Fx without Catastrophic or Severe CC	0,84	257	2.859	11,12	2.731	245
J06A	Major Procedures for Malignant Breast Conditions	0,54	36	486	13,50	1.748	129
J62A	Malignant Breast Disorders (Age > 69 with CC) or with (Cat or Sev CC)	5,39	14	295	21,07	17.586	835
J62B	Malignant Breast Disorders (Age > 69 without CC) or without (Cat or Sev CC)	0,36	497	5.427	10,92	1.158	106
L03A	Kidney Ureter and Major Bladder Procedures for Neoplasm with Cat or Sev CC	28,52	2	99	49,50	93.028	1.879
L03B	Kidney Ureter and Major Bladder Procedures for Neoplasm without Cat or Sev CC	0,76	133	2.305	17,33	2.471	143

L62A	Kidney and Urinary Tract Neoplasms, with Catastrophic or Severe CC	6,74	7	147	21,00	21.975	1.046
L62B	Kidney and Urinary Tract Neoplasms, without Catastrophic or Severe CC	0,32	634	3.661	5,77	1.060	183
M06A	Other Male Reproductive System O.R. Procedures for Malignancy	0,59	18	178	9,89	1.911	193
M60A	Malignancy Male Reproductive System with Catastrophic or Severe CC	6,85	7	164	23,43	22.347	954
M60B	Malignancy Male Reproductive System without Catastrophic or Severe CC	1,06	329	2.537	7,71	3.452	448
N02A	Uterine Adnexa Procedure for Ovarian or Adnexal Malignancy with CC	7,22	6	127	21,17	23.545	1.112
N02B	Uterine Adnexa Procedure for Ovarian or Adnexal Malignancy without CC	0,66	98	1.089	11,11	2.148	193
N03A	Uterine Adnexa Procedure for non-Ovarian or Adnexal Malignancy with CC	7,16	4	56	14,00	23.338	1.667
N03B	Uterine Adnexa Procedure for non-Ovarian or Adnexal Malignancy without CC	0,98	114	1.281	11,24	3.181	283
N11A	Other Female Reproductive Sys O.R. Procedures Age > 64 or with Malignancy or with CC	1,89	2	15	7,50	6.157	821
N60A	Malignancy Female Reproductive System with Catastrophic or Severe CC	12,60	4	156	39,00	41.084	1.053
N60B	Malignancy Female Reproductive System without Catastrophic or Severe CC	0,50	367	3.131	8,53	1.636	192
Q60A	Reticuloendothelial and Immunity Disorders with Catastrophic or Severe CC	2,74	8	107	13,38	8.921	667
R01A	Lymphoma and Leukemia with Major O.R. Procedures with Catastrophic or Severe CC	6,51	20	1.048	52,40	21.230	405
R01B	Lymphoma and Leukemia with Major O.R. Procedures without Catastrophic or Severe CC	2,56	54	1.621	30,02	8.345	278
R02A	Other Neoplastic Disorders with Major O.R. Procedures with Catastrophic or Severe CC	4,72	3	85	28,33	15.401	544
R02B	Other Neoplastic Disorders with Major O.R. Procedures without Catastrophic or Severe CC	0,89	30	426	14,20	2.912	205
R03A	Lymphoma and Leukemia with Major O.R. Procedures with Catastrophic or Severe CC	9,85	2	40	20,00	32.110	1.606

R03B	Lymphoma and Leukemia with Major O.R. Procedures without Catastrophic or Severe CC	2,79	13	436	33,54	9.095	271
R04A	Other Neoplastic Disorders with Other O.R. Procedures with Catastrophic or Severe CC	8,91	3	36	12,00	29.072	2.423
R04B	Other Neoplastic Disorders with Other O.R. Procedures without Catastrophic or Severe CC	1,01	81	724	8,94	3.283	367
R60A	Acute Leukemia with catastrophic CC	14,18	11	637	57,91	46.251	799
R60B	Acute Leukemia without catastrophic CC	7,89	40	1.845	46,13	25.745	558
R60C	Acute Leukemia without catastrophic or Severe CC	1,86	178	5.061	28,43	6.051	213
R61A	Lymphoma and Non-Acute Leukemia, with Catastrophic CC	16,35	15	541	36,07	53.326	1.479
R61B	Lymphoma and Non-Acute Leukemia, without Catastrophic CC	0,75	593	9.267	15,63	2.459	157
R61C	Lymphoma and Non-Acute Leukemia, SameDay	0,66	20	15	0,75	2.156	2.875
R62A	Other Neoplastic Disorders with CC	2,67	9	142	15,78	8.701	551
R62B	Other Neoplastic Disorders without CC	0,75	113	852	7,54	2.448	325
R63Z	Chemotherapy	2,67	16	16	1,00	8.711	8.711
TOTAL		1,00	5.469	65.065	11,90	3.261	274

As seen in the table, the average duration of staying in hospital, average patient cost and patient day cost show considerable variation. As mentioned above, it is not possible to make comprehensive costs analysis, hence anticipate cancer expenditures made in Turkey based on this data. But, after the changes envisaged in the social security system take effect, the electronic invoicing application is put into practice in an effective way throughout Turkey and the DRG-based payment system is adopted, it will be possible to make healthier estimations on this matter. A crucial point we should emphasize at this point is that there are two major aspects of studies on disease expenditures. The first of these aspects is, as also mentioned previously, the cost data, and the second is the data on the frequency of the disease in the society. Therefore, the availability of sound epidemiological data on the disease, as well as the cost data is necessary for expenditure estimations on the disease to be doable.

Conclusion and Assessment

In this paper, we tried to provide information on cancer expenditures both at global and country level. Cancer is a major health problem in the world and in Turkey as well. Since the diagnosis and treatment of the

disease require high technology, the share cancer expenditures take from the total health resources of countries has been increasing. The unavoidable increase in health expenditures is a fact being faced throughout the world. Policies to control these expenditures, without making concessions from the access to and quality of health services, are being developed and implemented in all countries. This development led to the need of monitoring the expenditures made on all diseases, not only cancer.

In parallel with the global developments, reform attempts in the delivery and financing of health services have been continuing in Turkey, passively since 1993 and actively since 2003. The developments of last years facilitated the access to health services for a larger section of the society, which in turn led to a considerable increase in health expenditures. Along with the envisaged changes in the financing of health services, this issue will continue to be on the agenda of Turkey in the coming years. The improvement of access to health services both in terms of service delivery and financing, will influence the diagnosis and treatment of cancer in various ways. For example, expansion of the General Health Insurance at a level to cover the entire society will reduce financial obstacles in front of access to health services and lower the number of patients, who do not consult to the system due to financial reasons and attempt self-treatment even though they need health care. The most important effect of this for the cancer disease will be the increase in the possibility of diagnosing the disease at earlier stages. The observations made regarding this issue indicate that the inability to diagnose cancer at early stages is a significant problem in Turkey. In parallel with this, the reinforcement of primary health care services and the expansion of the family physician model to cover the entire country will also facilitate early diagnosis of cancer. Both developments will lead to desirable outcomes for the solution of problems caused by cancer, but the natural consequence of these will be the increase in expenditures made for cancer, thus in overall health expenditures.

As mentioned frequently in this paper, it is difficult to detect the expenditures made for a particular disease for any country and the main reason of this is the requirement to have accurate data both on expenditures made for the disease and epidemiology of the disease. The difficulty with respect to expenditure data is due to the difficulties in calculating costs, whereas the difficulty with respect to epidemiological data is due to the lack of effective and reliable registry systems. As elaborated above, there are substantial deficiencies in Turkey in relation

to both issues. However at the current point reached in relation to health services, in order to be able to determine and apply sound policies it is necessary to take concrete steps and put them into practice.

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