Republic of Turkey
Ministry of Health
Turkey Public Health Institution
Cancer Control Department


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# TURKEY
# CANCER CONTROL PROGRAMME


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# TURKEY CANCER CONTROL PROGRAMME

ANKARA 2016

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# PREFACE

Cancer composes an important threat to public health both in our country and in global, thus cancer control problems are considered important for countries. Within this context;

While active cancer registration had only been applied only in two provinces before Health Transformation Program, with the studies executed recently active cancer registration has now been applied in 81 provinces. World Health Organization had established one of its 5 hup centers in Izmir.

As Ministry, among our cancer prevention activities, our fight against tobacco and obesity continue with very successful results. Additions to these programs, many new programs are initiated considering cancer such as Turkey Radon Mapping and action Plan, Turkey Asbestos Control Strategic Action Plan, Monitoring of Health Effects of Electromagnetic Areas.

In our cancer screening programs, Cancer Early Diagnosis, Screening and training Centers (KETEM) and our family practitioners provide screening services for breast, colorectal and cervical cancers free of charge with the motto "Early diagnosis saves lives!"

For the treatment of cancer patients, morphine and chemotherapy medicine are now being manufactured in our country. All our citizens have access to treatment applied in competence with international standards.

Of course, beyond the success of our efforts related with cancer, there is the country-wide political stability and determination. Constitution of an effective "National Control Program" is one of the most important steps. For this purpose, by following up all developments in science as well as health policies and involving our national experiences obtained in the first phase, second five year plan for "National Cancer Control Program" to be executed for 2013-2018 has been prepared. I thank precious scientists who contribute the formation of this program, wish it will bring auspiciousness for entire nation…

We are aware, we will beat cancer…

Dr. Mehmet MÜEZZİNOĞLU
Minister of Health of the Republic of Turkey

In 2011, United Nations called its members to prepare and apply national programs to fight against cancer which has been defined as the disease of the century and which is also considered as a global problem. Turkey renewed National Cancer Control Plan in 2013, that had been firstly announced in 2008 and initiated its struggle with cancer disease.

Cancer is an important public health problem both in our country and globally. Among the most important causes of cancer, there is the tobacco use, unhelthy diet, obesity, alcohol and infections. Especially evaluating our country data, our tobacco and obesity programs compose the corner stones of cancer control. Notwithstanding, increasing of physical activity, limitation of salt usage, fight against infection agents are also important factors. Without a doubt, cancer can only be controlled with preventive precautions rather than making investments on treatment. These control programs, which have been executing for years in our country are strenghtened and accelareted following the establishment of Turkish Public Health Institution.

Society based cancer screenings used to be only applied in Cancer Early Diagnosis, Screening and Training Centers (KETEM). With the operating of Cancer Directorate under Turkish Public Health Institution, family practitioners unit and public health centers contributed to the screenings and screening activities were extended to every corner of country, screening speed also increased.

In a period where more than 12 million people are diagnosed cancer annually, we are aware of our responsibilities in fight against cancer. This program is a very essential source since it provided guidance on how the challange should be managed. I want to thank our respectable scientists who contributed to this book and wish our National Cancer Control Plan will be auspicious for our entire nation.

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| Palliative Nurseling Services Association(PASHIDER) | Ankara |

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# WHY A NATIONAL CANCER PROGRAM?

Like all over the world, cancer is one of the most important public health problems in Turkey. Cancer is second cause of deaths worldwide and it is predicted that it would be first cause by a rapid increase until 2030. Evaluation of 2012 data reveals that about 175,000 new cases with cancer have appeared within one year (Figure 1). Projection values of age standardized rates for Turkey between 2013 and 2023 indicates that the cancer load gradually increases by a decrease with aging (Figure 2).A complete and efficient control of the disease would be possible through a dynamic, multidirectional, scientific, multidisciplinary and cost-efficient program.

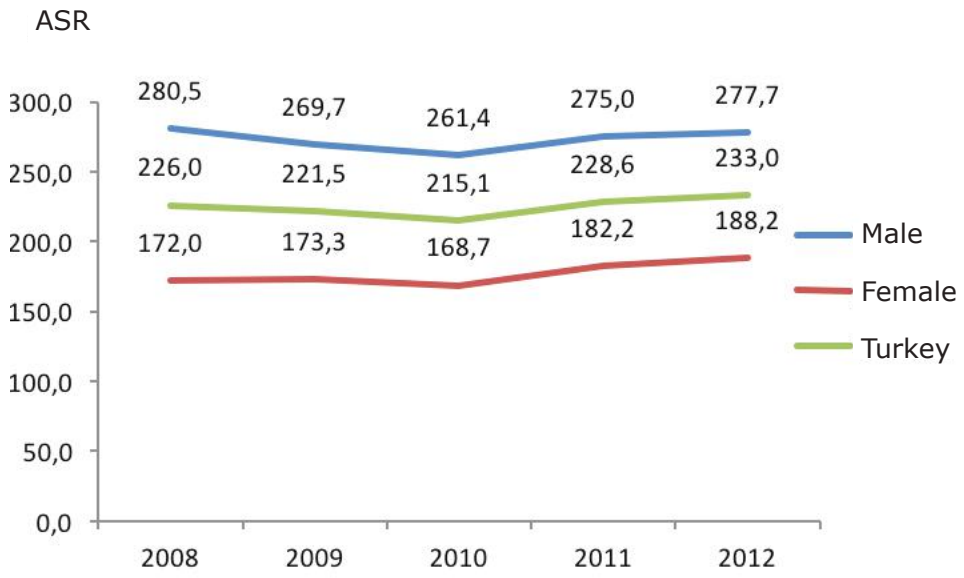



**Figure 1.Distribution of Incidence Rates Standardized for Age for All Cancers Between 2008 and 2012 (Turkey Compositional Database, 2008-2012) (World Standard Population, per 100,000 individuals)**

Turkey is one of the countries with cultural, economic and social differences.Such differences cause a very complex presentation when control of a disease such as cancer which may develop by multiple factors is discussed. Because, cancer cannot be explained by genetic tendency only and may develop due to smoking, nutrition, the air inspired environmental conditions, sedentary lifestyle, technological developments and many other factors.

The promising part of such presentation is majority of the cases with this disease may be prevented through simple and economic preventions. For instance, lung cancer is the most common type of cancer observed in our country like all over the world (Figure 3).90% of lung cancer cases appear due to smoking in our country. Rate for use of tobacco products is over 30%, one of each three children under 10 years of age is exposed to passive smoking and 300 individuals die because of the disease developed by smoking every day. Approximately 110,000 lives could be saved even by an efficient tobacco control.

One of the main topics of preventive activities of our country is obesity counteracting. Obesity counteracting is a very important strategy not only to prevent cancer, but also to prevent cardiovascular diseases which have more morbid outcomes. Within this scope, the need for a multidirectional and detailed national cancer control program is clear

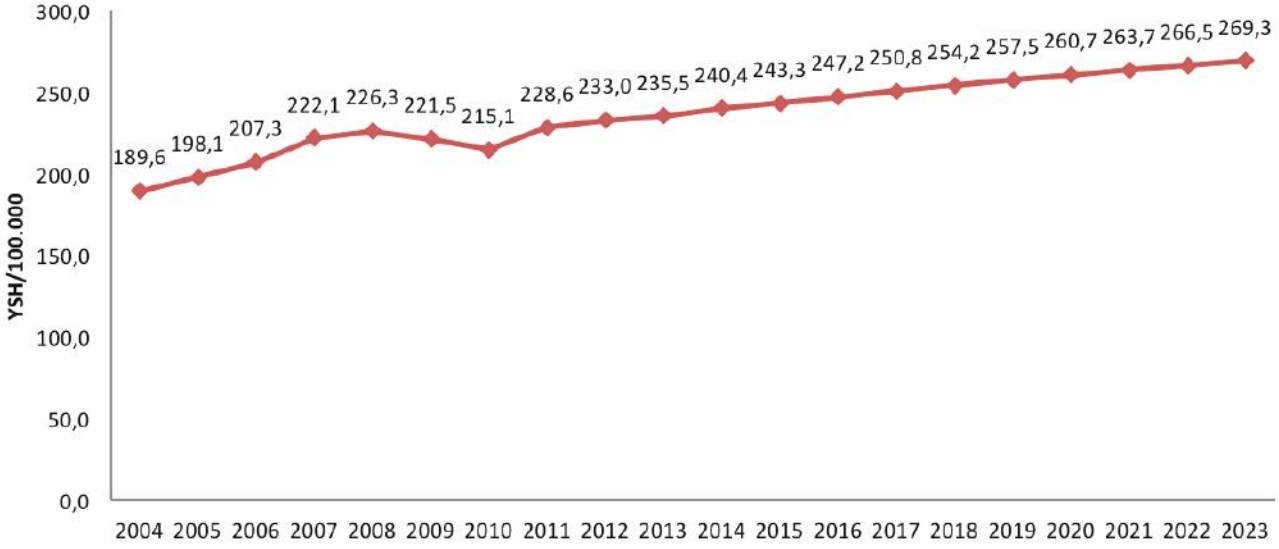



**Figure 2. Projection of cancer incidence for Turkey between 2013-2023 (Source:TR Ministry of Health Cancer Department)**

Like breast, cervix and colorectal cancers, early diagnosis and treatment of these cancers are possible through appropriate programs. Majority of the cases with breast, cervix and colorectal cancers according to available data are detected at regional and far metastasis level. Within such scope, manifesting the problem and national level, development of a national screening program within available options and application to country-wide by considering the regional differences are essential.

For an efficient cancer control, best palliation should be achieved to provide a qualified and longer life for all patients diagnosed earlier or later and to treat the disease as best as could be. A national cancer control program considering national resources and requirements is needed to carry out all aforesaid preventions within a certain plan.

Consequently, for an efficient management of cancer control stages accepted worldwide, country data, socio-cultural characteristics, human resources and financial resources should be evaluated individually; and steps to be taken should be prioritized and most importantly, a national program which is acknowledged generally by participation of all appliers should be created. A systematic and general war against cancer, one of the most significant and frightening health problems of our age could be won by this way only.

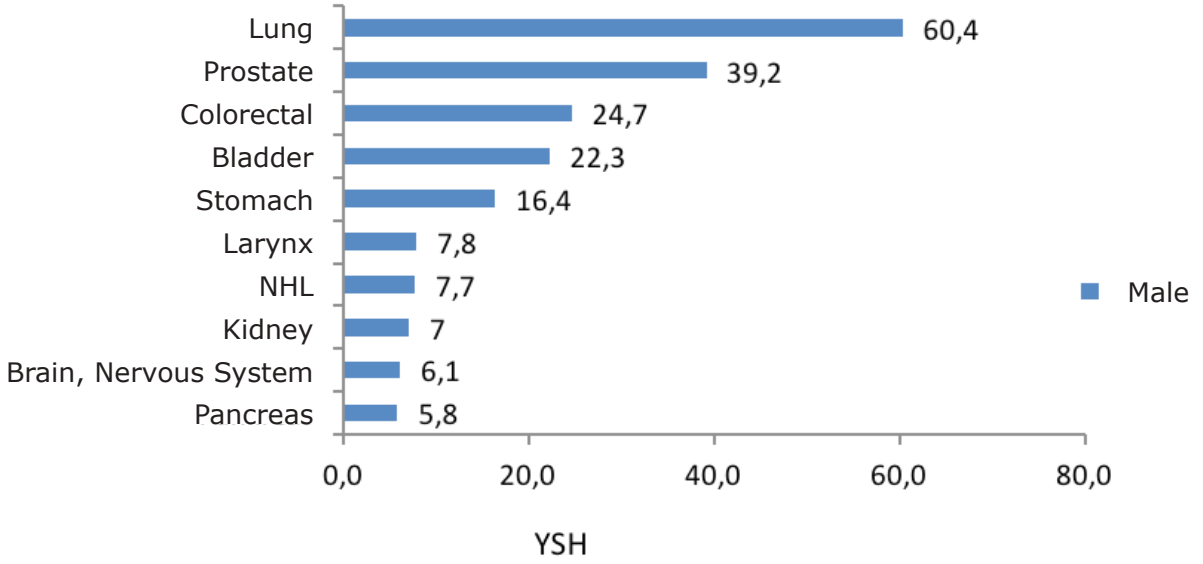



**Figure 3. Age-Standardized Rates of 20 Cancer Types which are Most Common in males (Turkey Compositional database, 2012) (World Standard Population, per 100,000 individuals)**

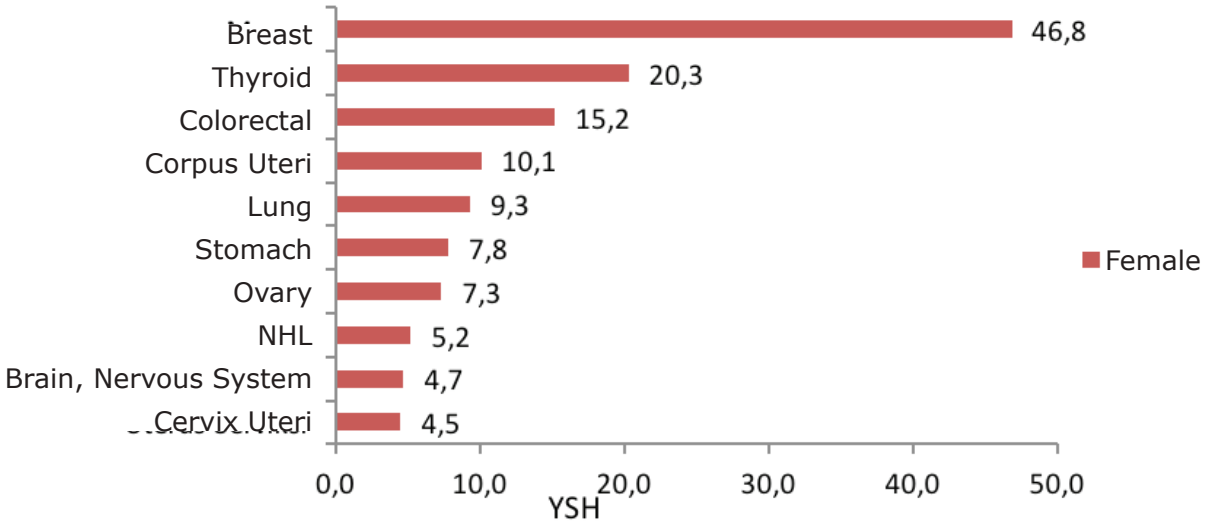



**Figure 4. Age-Standardized Rates of 20 Cancer Types which are Most Common in females (Turkey Compositional database, 2012) (World Standard Population, per 100,000 individuals)**

## Development Stages of Turkey Cancer Control Program (TKKP)

Our ministry has collaboration with many national and international organizations and institutions to be able to monitor the scientific developments and good practices about cancer worldwide and to serve as a model for some countries;

1. WHO (World Health Organization),
2. IARC (International Agency for Research on Cancer),
3. IACR (International Agency for Cancer Recording),
4. UICC (The Union for International Control of Cancer)
5. NCI (National Cancer Institution)
6. APOCP (Asian Pacific Organization for Cancer Prevention)
7. MEEC (Middle East Cancer Consortium)
8. NHS (National Health Services)

This program which was documented by participation of all concerning parties and leasing scientists of our country acting in cancer control and aimed to guide all internal and external shareholders was prepared through collaboration of Cancer Department of Turkey Public Health Agency and World Health Organization.

The priorities for collaboration between World Health organization/Europe and Ministry of Health were organized by a two-year collaboration agreement signed between Turkey and European Office of WHO. Five privileged topics were determined "to develop policies for non-communicable diseases by Ministry of Health and to strengthen the capacity for implementation" by the Collaboration Agreement signed within 2008-2009. These topics include cancer management, prevention, palliative care, prevention of obesity and tobacco management.

WHO, together with Ministry of Health, organize and finance workshops to create a TCMP (Figure 5) to reduce cancer-dependent deaths and to increase the quality of life for cancer patients through implementation of evidence-based strategies for prevention, early detection, diagnosis, treatment and palliation by enabling use of current resources of WHO as best as possible with participation of expert organizations and individuals on this issue.

The first phase of Turkey Cancer Management program was carried out between 2008 and 2013. The second phase of the program was created through our experiences during the aforesaid process and under the light of new international scientific data by consulting with our national consultation boards for cancer as well as many active international organizations and institutions (WHO, IARC, European Union Scientific Commission) (2013-2018).

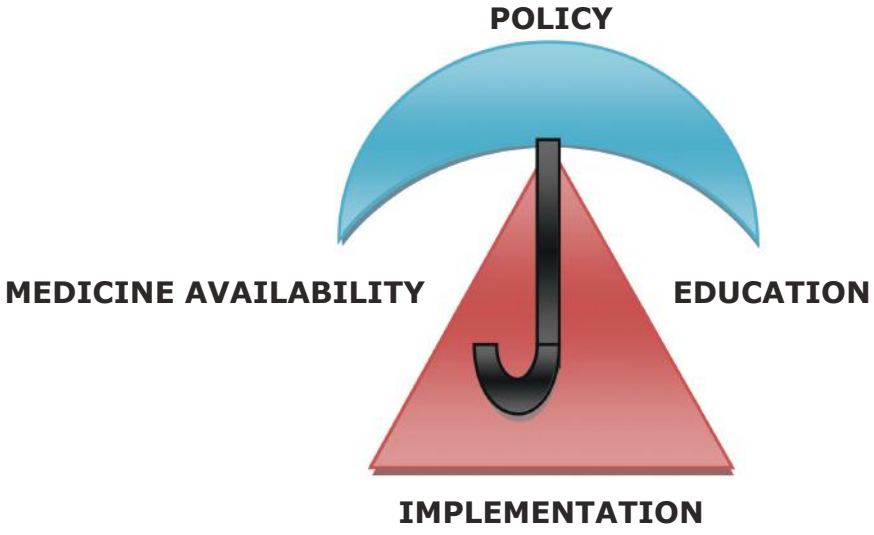



**Figure 5. Strategy of WHO for TCMP Foundation Measures**

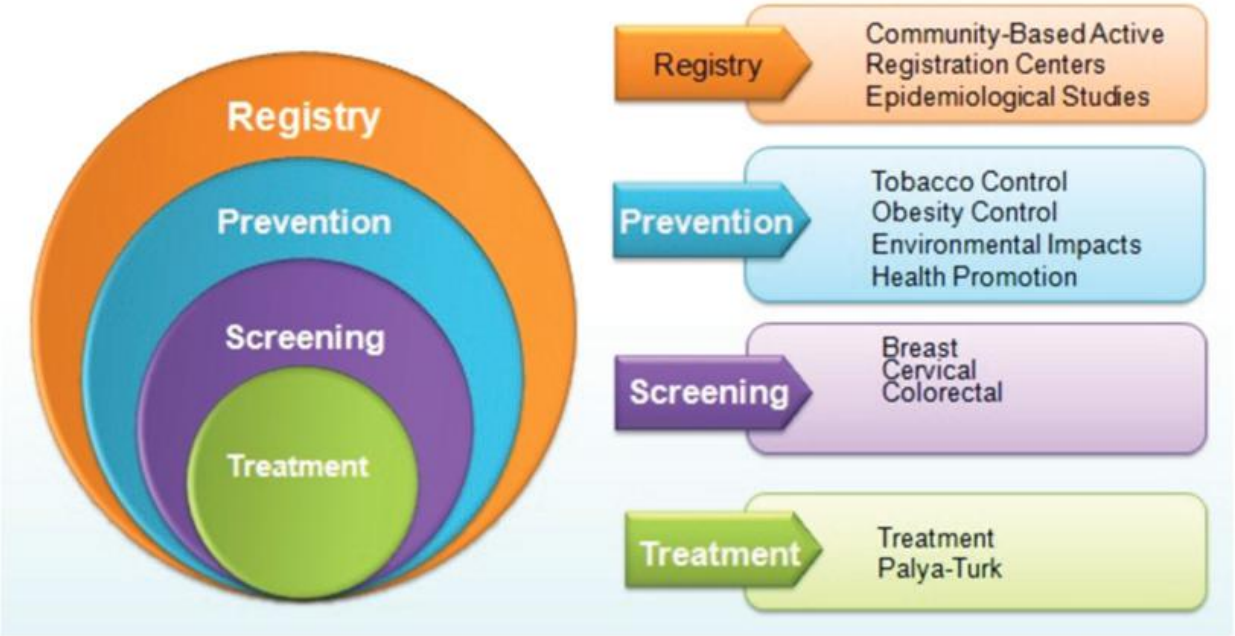



**Figure 6. Turkey Cancer Management Program**

## Principals of a National Cancer Management Program

A comprehensive National Cancer Management Program performs cost-efficient studies including majority of the population to control the disease. Regarding the cancer management programs, early detection and treatment of the cases, development of treatment guidelines enable symptom control and high quality of life as much as possible for the patients at advanced stage.

National Cancer Management Programs are adapted to socioeconomic and cultural structures of the countries. National Cancer Management Programs help policy makers and program directors to use the current resources efficiently to develop a sufficient, fair, sustainable and reproductive strategy. Implementation of a National Cancer Management Program should be carried out in steps by identifying and undertaking the most urgent and most beneficiaries.

In the WHO concept for an integrated Public Health National Cancer Management Program, Framework Contract for Tobacco Counteracting, Global Diet Strategy, Physical Activity and Health, counteracting with non-communicable diseases and global epidemics of cancer are very important. These are the most important causes for death today. Every year, 38 million of 58 million deaths occur by non-communicable diseases. 20% of the deaths related to non-communicable diseases occur in high income countries whereas 80% appear in medium and low income countries.Therefore, our National Cancer Management program comply with the management programs prepared by other departments of our ministry and include counteracting plans with such chronic diseases beyond cancer.

For instance, obesity management program, tobacco management program and diabetes management program of Turkey have an association with each other. National Cancer Management Program includes many sectors and organizations. Although prevention, screening and palliative care are the most significant investments, the program does not appear solely, but also include wider health reforms. Healthy maintenance of the services may be provided by integration with the Family Practice System which has been established within the scope of Health Transformation program in Turkey. Through this system which includes each section of the society and provides easy access by the needer, Turkey Cancer Management Program could achieve the targets. In consideration of the target population, importance of such integration would be acknowledged better.

# CANCER RECORDING

When data of developed and developing countries are reviewed, incidences and profiles of cancers differ between the countries. In developed countries, lung and prostate cancers in men and breast and colorectal cancers in women are more common. On the other hand, lung, stomach and liver cancers in men and breast and cervical cancers in women are more common in developing countries. In Turkey, lung, prostate and urinary bladder cancer are more common in male population. Breast, thyroid and colorectal cancers appear more in female population.

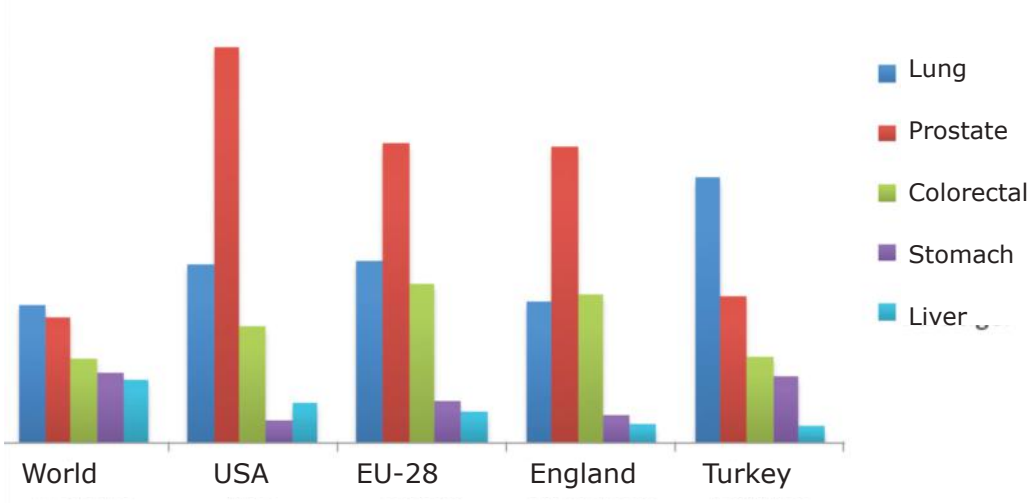



**Figure 1.1.Worldwide Rates of 5 Most Common Cancer Types in Men Standardized According to the Age on Regional basis, per 100,000 individuals (Globocan 2012)**

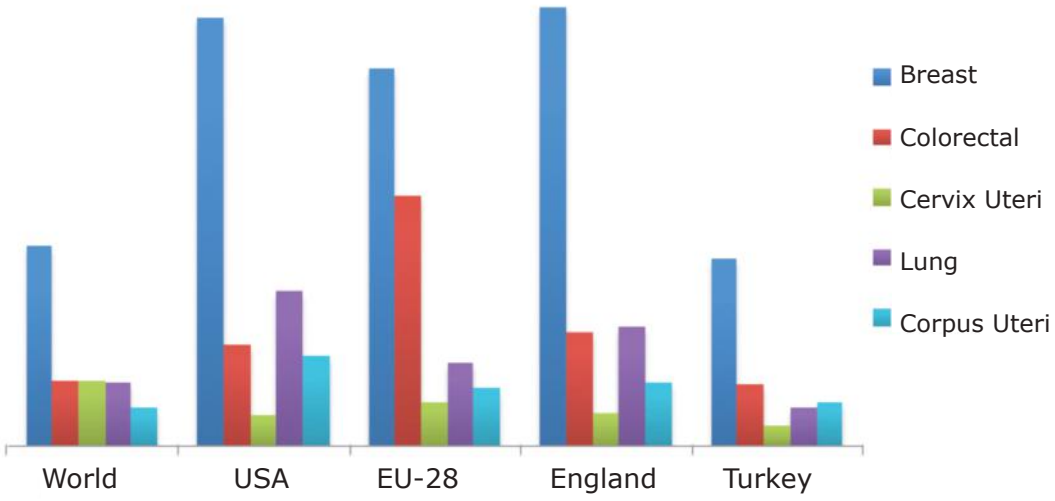



**Figure 1.2. Worldwide Rates of 5 Most Common Cancer Types in Women Standardized According to the Age on Regional basis, per 100,000 individuals (Globocan 2012)**

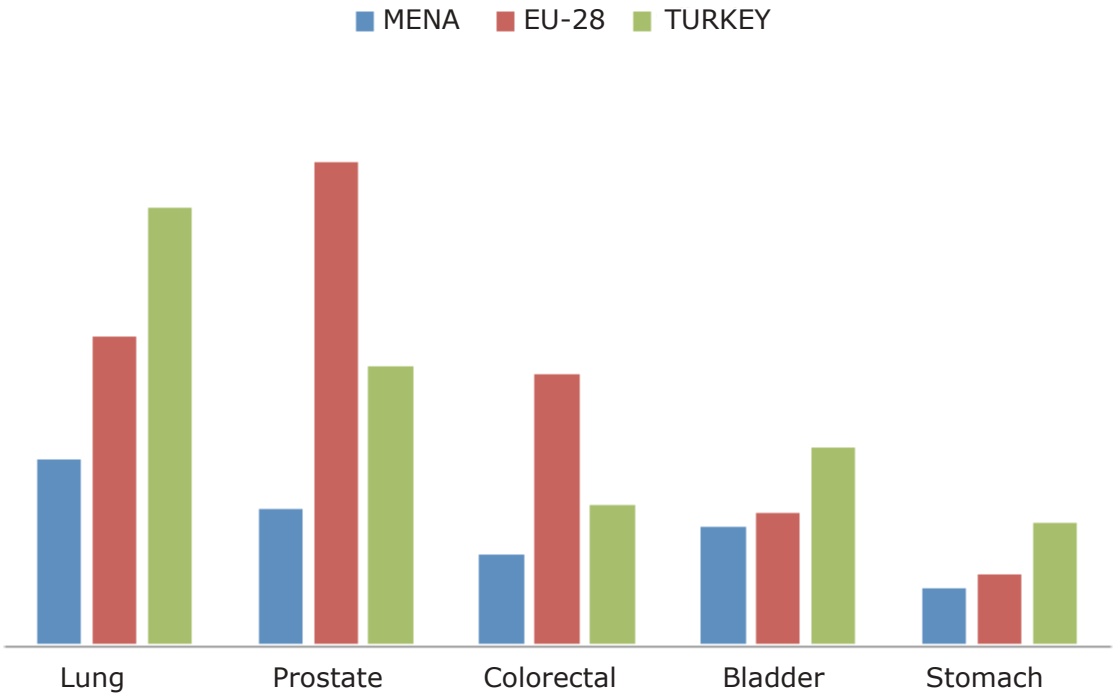



**Figure 1.3. Rates of Common Cancer Types in Male Population Standardized According to the Age in Turkey, per 100,000 individuals (Globocan 2012)**

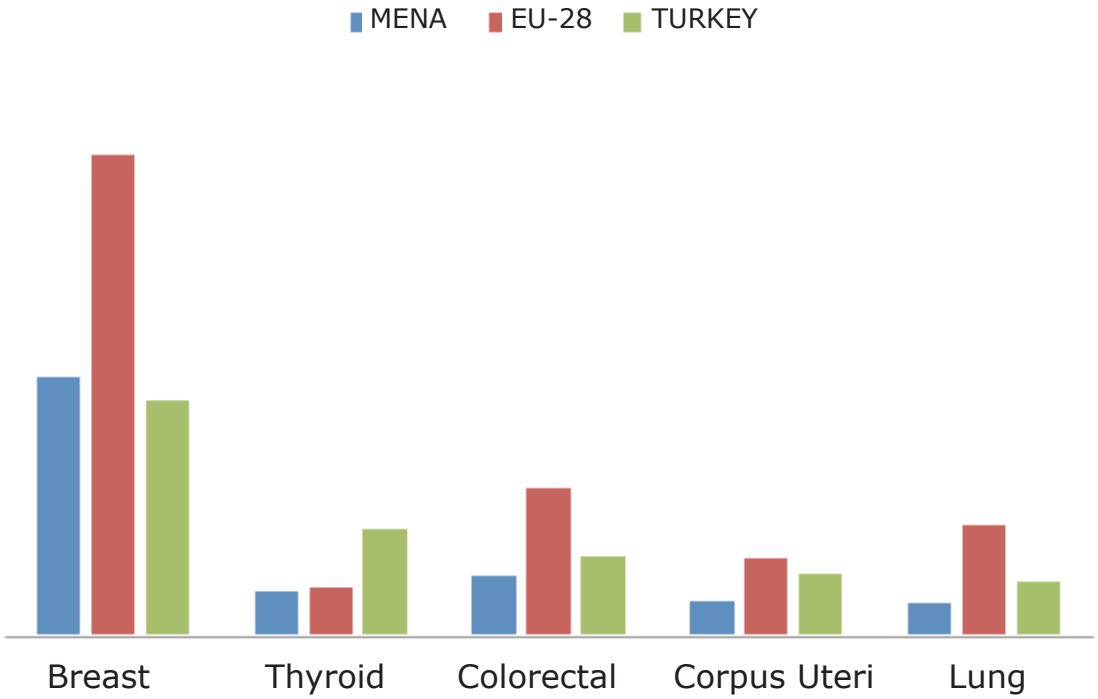



**Figure 1.4. Rates of Common Cancer Types in Female Population Standardized According to the Age in Turkey, per 100,000 individuals (Globocan 2012)**

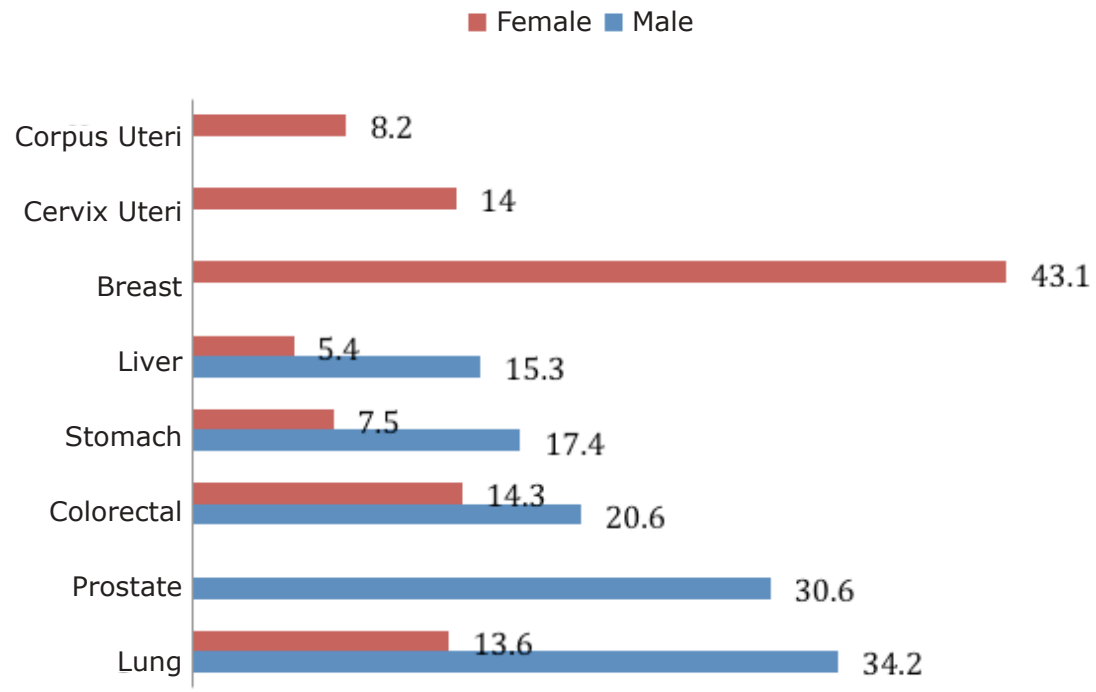
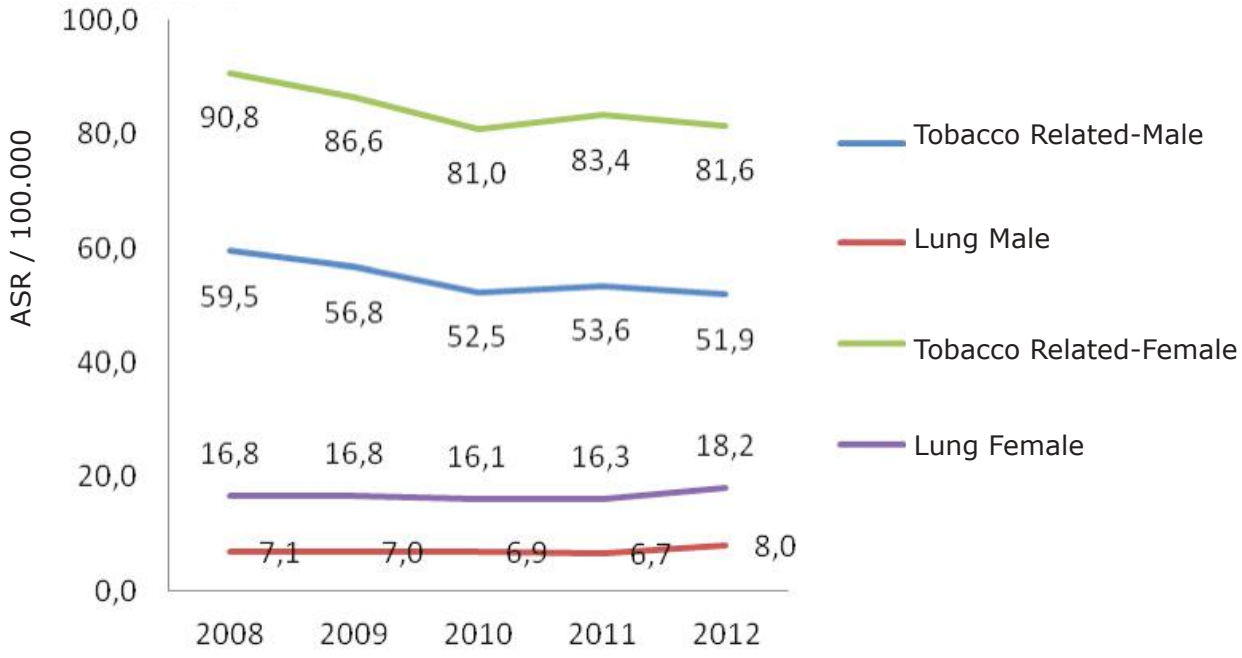
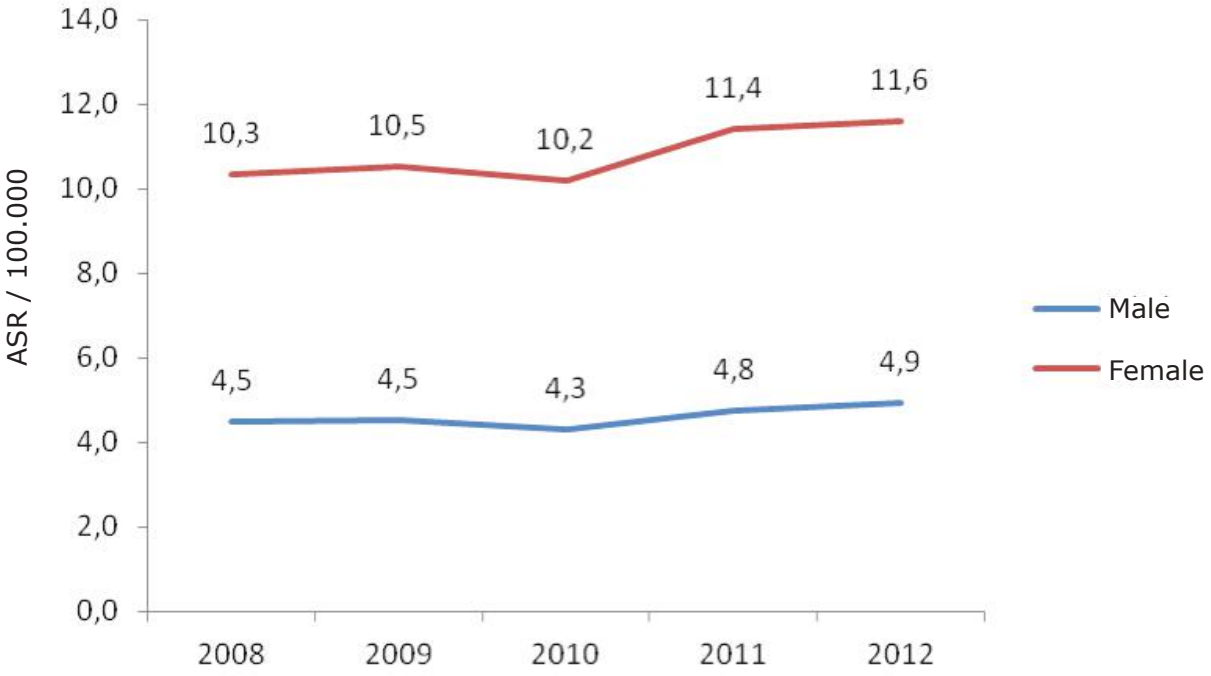



**Figure 1.5.Rates of Most Common Cancer Types Worldwide Standardized to the Age, per 100,000 individuals (Globocan 2012)**




Tobacco-associated Cancers* & Lung Cancer
*For men, Mouth, pharynx, esophagus, stomach, colorectal, liver, pancreas, larynx, lung, kidney; for women, mouth, esophagus, stomach, colorectal, liver, pancreas, larynx, lung, cervix, ovary, kidney, bladder, leukemia

**Figure 1.6. Distribution of Age-standardized Incidence Rates of Tobacco-Associated Cancer Types Imputed to Tobacco between 2008 and 2012 (Turkey Compositional Database, 2008-2012) (World Standard Population, per 100, 000 individuals)**




Obesity-associated Cancers*
*For women, esophagus, colorectal, gall bladder, pancreas, breast, corpus uteri, ovaries, kidney; for men, esophagus, colorectal, pancreas, kidney

**Figure 1.7.Distribution of Age-standardized Incidence Rates of Obesity-Associated Cancer Types Imputed to Obesity between 2008 and 2012 (Turkey Compositional Database, 2008-2012) (World Standard Population, per 100, 000 individuals)**

Incidence of cancer gradually increases in Turkey in years. However, a significant part of such increase is due to the progress in cancer recording through healthy data gathered in the recent years; therefore it does not represent a real cancer epidemics case.

In a review of Globocan 2012 data, incidences of Middle East and Northern Africa (MENA) countries are observed lower than both European Union (EU-28) and Turkey. Such difference brings the question in what stage the cancer recording stands forward in MENA countries. When Turkey and EU-28 are evaluated together, incidences of breast, prostate and colorectal cancer are higher than Turkey.

## 1.1 Cancer Recording System in Turkey

History of cancer recording activities in Turkey is not old. Although institutionalization of cancer management activities in Turkey has started 1940s, it will not wrong to say that efforts of cancer management has started by including the cancer into notifiable diseases which were set out in Article 57 of Public Health Law 1593 in 1982, according to Parliamentary Mandate 5621 dated on 14.09.1982. On the global scale, Hamburg Cancer Recording has been founded in 1926 and had a legal status in 1929. Such organization has become a completely operated cancer recording in 1937. Furthermore, the cancer recording in Slovenia publishes the incidence, prevalence and survival rates since 1950. As the samples above indicate, cancer recording activities has started at early 1900s in many developed countries on a global scale.

Through enforcement of mandatory cancer notification, a "Cancer Counteracting Department" has been founded in 1983 by the Legislative Decree 181 to carry out cancer recording activities. One of the basic tasks of Cancer Counteracting Department is to collect qualified cancer records reliably and correctly.

Turkey has become a member of IACR in 1989. Izmir and Diyarbakir Cancer recording centers were opened within the scope of Cancer Recording and Incidence Project in 1992 first. These two centers led up data collection on international standards.

Antalya Cancer Recording center has started cancer recording actively in 1998.

A "Regulation for Cancer Recording Center" was enforced in 2000 and cancer data were started to be collected. Data from selected population regions, not from all population, are actively collected to reveal cancer profiles of the countries and predictions for countries are calculated in cancer recording studies. In cancer recording surveys carried out scientifically in the world, records representing at least 20% of a country population should be collected to be able to reflect the data of that country.
National Cancer Consultation Board and Department personnel reviewed the Active Cancer Recording System in 2006. By decision of Sub Committee of Cancer Epidemiology and Cancer Recording Consultation dated on 05.01.2006, the cities which might have kept qualified records within shortest period to provide efficient use of the resources through review of the activities of the cities within the frame of active cancer recording system have been identified; and training supervision activities on-site were performed in Ankara, Izmir, Erzurum, Edirne, Eskisehir, Samsun, Trabzon, Antalya, Bursa centers and providing a more efficient monitoring of the studies were decided; population of the aforesaid 9 cities has created about 23% of our population.

In 2002, WHO IARC utilized Izmir cancer recording center for Globocan and accordingly confirmed the quality of data obtained from this city.

Turkey has become an official member of Middle East Cancer Consortium (MECC) by signature of the Minister in 2004.The activities has been transformed as a collaboration with MECC.

In 2007, data of Izmir and Antalya has been published in a book named "Cancer Incidence on Five Continents".

Geographical regions as well as the cities which would perform a professional cancer recording and reflect at least 20% of the country population has been selected in our country in 2010; and 10 Active Cancer recording Centers collecting data through this system have been founded.

(Ankara, Antalya, Edirne, Eskisehir, Erzurum, Izmir, Kocaeli, Samsun, Trabzon, Bursa)

Studies have been started to provide a data flow from all regions of our country in 2012 and such number has been increased up to 28 and then 81 gradually in 2013. Data of Trabzon and Edirne has been published in a book named "Cancer Incidence on Five Continents".

In our country there are three provinces yet that gather data with active cancer registry system apart from nine provinces that are approved about quality and complement of cancer data. These provinces are Gaziantep, Kocaeli and Malatya. In 2012 Istanbul, Mersin and Adana were included to these provinces and totally with 15 provinces authority of data used for cancer registry of our country reached to 47%.

By these data gathered it has been aimed to calculate incidence relating to cancer types, to determine the distribution of these incidences according to age groups, gender and regions; by evaluating the incidences that are lower or higher than expected to put forward thesis that will be mentioned for new search about cancer reasons peculiar to the region, to constitute data base for scientific researches and to reach data that will provide cancer protection.

In recent years these activities conducted by our Department have been increased and studies about forming an intense registry system that is the first step of cancer control have been continued.

The personnel that are assigned in these provinces take "Basic Cancer Registry Education" that basic information about cancer epidemiology and cancer registry are given, "Can reg4 Computer Program Education" to provide the transfer of data used in cancer registry to electronic environment, to provide data storage and to make the quality control of data, "SEER Summary Staging Education" to search the prevalence and nature of cancer, to evaluate the effectiveness of treatment, to gain skills about using criteria such as measuring of survival. As of the date of September 2014 these educations were completed in 68 provinces.

Our department is the member of international organizations such as IARC (International Agency for Research on Cancer), MECC (The Middle East Cancer Consortium), ENCR (European Network for Cancer Registries) and UICC ( International Union Against Cancer) and also our department attends to the congress and meetings organized by these organizations about cancer registry and it contributes to studies. Obtaining accurate cancer data that is the most important phase of cancer control program has been considered important in recent years and the quality of our data have been increased.

## 1.2. Active Cancer Registry Activities Conducted in Turkey

Operation diagram below was applied in active registry activities conducted in 81 provinces.

- Firstly health management authorities related to the subject of each province were informed. Information campaign started from Governorship. Authority supported the subject.
- The population, the situation of hospital and other sources of each province were evaluated and the necessity of cancer registry personnel were identified.
- By taking into consideration of Center of Cancer Registry of Izmir, standard education programs within the scope of IARC and MECC standards were formed.
- Cancer Registry Form that would be used was revised.
- The education of personnel was performed.
- During the visit of provinces, problems result from the provincial administration or hospital administration were tried to be identified and be worked out.
- First diagnosis date in Cancer Data Set that was included in Information Management Systems of Hospital, histological type and parameters of location of tumor were obligated.
- To invoice the codes of Health Practices Notification (SUT) that takes place in Pathology (Cytologic Materials, Histopathologic Research, Specific Pathologic Investigations and Electron Microscopic Examinations) which has a sequence number of 4724 in Point List of Health Facilities and whose process number is 9.7. and to provide them take place in Information Management Systems of Hospital , the protocol is on the point of being signed with SSI for them to be a basis to repayment.
- To provide a synchronous dataflow from web base to be used in cancer registry, the studies about a software named TURKCAN started.
- In 2013 data of Cancer Registry Centers such as Antalya, Izmir, Trabzon and Edirne were found valid enough to be accepted to X. Chapter of Cancer Incidence in Five Continents (Curado M. P., Edwards B., Shin H.R., Storm H., Ferlay J., Heanue M. And Boyle P., eds, 2007, Vol. IX IARC Scientific Publications No. 160, Lyon, IARC) published periodically by IARC (International Agency

for Research on Cancer) and they were published and included in the book.

- In the provinces quality control was completed in 2014, with the data of 2010 data repository was formed and by reprocessing the data in this repository (control of duplication among provinces, quality control, etc.) their analysis were made.
- In this study, according to the calculations made by using data repository of cancer registry centers based on population of nine provinces predictions of Turkey's cancer incidence were made for 2010, they were compared with the results of 2004-2008 on the basis of incidence value. In the calculation of incidence, population data of ADNKS (Address based Population Registration System) published by TUIK( Turkish Statistical Institute) were used as denominator. According to the data of TUIK in 2010, the population of our country is 73.722.988. The population of the provinces selected here is 17.244.896.
- Analysis of the data about 2011-2012 have been made by the Department and the statistics about these years will be published in 2016.

## 1.3. Educations Performed Within the Scope of Active Cancer Registry System

1- Basic Cancer Registry Educations

- Totally 10 Cancer Registry Education were provided.
- In each education approximately 30 KKE (Cancer Registry Employee) were educated.
- It is an education for 4 days.
- 176 personnel were educated.

2- SEER Summary Staging Education

- Totally 4 SEER Summary Staging Education were provided.
- In each education approximately 27 KKE were educated.
- It is an education for 3 days.
- 30 personnel were educated

3- CANREG-4 Bilgisayar Programı

- Canreg-4 Computer Program Education were provided to computer users.
- It is an education for 3 days.
- 30 personnel were educated.

## 1.4. Data Gathered by Active Cancer Registry System

**Demographic Data:**

1. Name(s)- Name, Surname, Father's Name
2. Address, Street and Province that are valid in the date of diagnosis
3. Place of Birth
4. TR Identity Number
5. Age during Diagnosis
6. Date of Birth
7. Gender

**Medical Data:**

- Date of Diagnosis:

1. It is used to determine the year that the patient will be included in the calculation of incidence and his/her survival period.
2. It is the date when the doctor explains that the patient is cancer patient.

- Diagnosis Method:

1. Anatomical (Topographic) location
2. Histological (morphologic) location
3. Behavior
4. Degree

5. Laterality Paralysis
6. Tumor row
7. Stage during diagnosis

- Treatment data:

1. Surgical operation
2. Radiotherapy
3. Chemotherapy
4. Hormone therapy
5. Immunotherapy
6. Other therapies
7. Date(s) of treatment
8. Order of surgical operation and radiation

## 1.5. Data Sources in Active Cancer Registry System

- The places where medical records are kept;

1. Hospitals
2. Clinics
3. Doctor's clinics
4. Pathology laboratories
5. Radiation (oncology) therapy centers

- The places where medical records are kept;

1. Medical oncology centers
2. Dispensaries
3. Forensic medicine centers

- Death certificates

## 1.6. Quality Control in Active Cancer Registry System

To reach at the accurate results about cancer incident in a specific population, accurate and complete cancer registry data are needed.

1. Comparability

- Statistics that are made by cancer registry center must be comparable for different societies and/ or different periods. Basic precondition of comparability is to get across of universal standards and rules. Data terms and relating terms must be identified clearly, guide for "rules and identifications" must be prepared and changes must be documented.
- Data elements that will be gathered,
- Inclusion of the incident into database,
- Date of diagnosis,
- Method of diagnosis,
- Multiple primer,
- Location of primer,
- Stage of disease, etc.
- The subject about usage of data and information (confidentiality) must be included in this document.

Guides used for the setting of the rules:

- WHO/ IARC / IACR ( World Health Organization / International Agency for Research on Cancer / International Association of Cancer Research)
- ENCR (European Network of Cancer Registries)
- SEER (Surveillance, Epidemiology and End Results, USA)
- MEEC (Middle East Cancer Consortium)

2. Accuracy
a) Completeness
All cancer cases that emerge in target population are included to what extent in database of cancer registry center

Methods used to test the completeness:
- Data resources
- Independent case research
- Historical data method

b) Validity
In the registry center, determination of whether the quality of the cases whose specifications are identified is at real rate is able to be confirmed by overlooking at resource, accuracy of documents, summarization, codification and the skills about registration.

## 1.7. Reliability in Cancer Registry System and Quality Control Evaluations

In Turkey, quality control and reliability of information in cancer registry system are made by the methods that are determined by IARC. In Turkey firstly data of Izmir went through a process of quality control and data obtained from this province started to take place at the database of IARC. In order to use the data confidently obtained from 9 provinces that represented 23,3% of Turkey, data reliability and quality control system started to be operated in these provinces. Izmir, Antalya, Ankara, Bursa, Samsun, Trabzon, Eskisehir, Edirne and Erzurum are the provinces where data reliability and quality control system are made according to the criteria of IARC. These provinces give examination and evaluation reports regularly to Department of Cancer. In the scope of these reports there are information about general situation, personnel, data and physical conditions of cancer registry center. Data analysis about control studies of cancer registry is included in these reports. At cancer registry centers, data are evaluated under 5 basic titles. These are;
1. Completeness of cover of data resources
2. Completeness of detail of cases obtained from resources
3. Reliability and accuracy of detail
4. Accuracy of reporting
5. Accuracy of interpretation and evaluation of data and data resources

**Some cases are evaluated under the title of major and minor criteria:**
- Evaluation period of major inconsistency

1. Inconsistency between gender and location of tumor
2. Inconsistency between histology and locations of tumor
3. Inconsistency between date of diagnosis and date of birth
4. Inconsistency between last control date and date of diagnosis
5. Inconsistency between vital situation and date of diagnosis and last control date
6. Inconsistency between histology and diagnosis method
7. Inconsistency between behavior codes

- Evaluation period of major inconsistency

1. Permissible time slots at deviations in the date of diagnosis are evaluated.
2. Defaults about months arising from alienation of year at the calculation of age during diagnosis and date of diagnosis are evaluated. Defaults about age arising from that although the age of the patient is known, it is not known as month and day are corrected.
3. Defaults that may occur about the record of district, village and township although it is recorded correctly on the basis of province during the reporting of place of birth and address are evaluated.
4. Resume stage during diagnosis (SEER) is evaluated.

Re-availability of data, data leakage and its convenience for detection of repetitions are evaluated by controlling file archival storage at registry centers. Data are found from archive and all files are examined, reliability of data are evaluated, it is reported to the center.

## 2.1. Present condition in the World

Cancer is a difficult disease to fight against, not only in terms of its physical disorders but also considering its social, material and spritual aspects. Around the world burden of cancer disease increases day by day. It is known that the most important control strategy about cancer is prophylaxis and early diagnosis in 21th century. Because of this reason it is important to determine carcinogen and to take necessary precautions.

Cancer is an important community health problem because it is the second cause of death at sort of deaths whose cause is known both in the world and in our country just after cardiovascular diseases. Although deaths because of cancer composed 12% of the deaths in our country in 2002, this rate arose 21% in 2009. The importance of prophylaxis increases when we consider the cancer types that especially their emergence can be avoided, deaths from cancer can be avoided with screenings and when they are diagnosed early, treatment adds a lot of things to life quality.

If similar course continues in cancer, it is expected that in 2030 22 million new cases may occur and according to data of 2008 at new cases there may be an increase of 75%.

Cancer causes from environmental factors at the rate of 90%, however from genetic factors at the rate of 10%, among environmental factors tobacco, alcohol, obesity and infections take place on the top. Prevention studies that are the most important step about struggle with cancer include it and struggle with other environmental factors and also policies of countries that are developed for this struggle.

Lung cancer that is the most important cancer avoided by primary prevention is the most frequent type of cancer in our country and in the world. Carrying out the struggle with tobacco successfully will be able to exterminate firstly lung cancer and also mostly laryngeal, bladder, pancreatic, cervical, pharynx and oral cavity cancers.

In the world about 1,2 milliards(in some sources about 1,3-1,5 milliards people) that arise from one out of every three adults at the population over 15 use tobacco. In Turkey about 15 million people at the population over 15 use tobacco.

Around the world, per year about 6 million people die because of diseases relating to using tobacco. In our country, 23% of all deaths cause from diseases relating to tobacco. If using tobacco continues in this manner, it is expected that number of people who die because of using tobacco may pass over 8 million per year in 2030. In Turkey, now the number of people who die because of tobacco is 100.000 per year, and if precautions aren't made, it is expected that this number will be 240.000.

It is known that alcohol is determined as harmful for health in lots of sides by World Health Organization, also the most important health effect of alcohol is cancer and it causes a lot of cancer types and it continues to be the reason of mortality and years of potential life lost relating to cancer. Apart from these, it is known that alcohol has a lot of social and economic harmful effects. It is harmful for health

because it causes various cancer types, besides it imposes a burden for states with its economic and social harms, so international alcohol action plans come to the fore.

WHO European Zone became to first region to approve alcohol action plans both in 1992 and 2000. European Commission in 2006, focusing on protecting youngsters, children and unborn child, initiated an EU strategy composed of:

- For decreasing of harm related with alcohol
- For decreasing deaths and injuries of accidents caused by alcohol consumption
- For decreasing negative effects at the work place
- In order to inform individuals about the negative effects of alcohol consumption, increase awareness in society and in order to establish a common evidence base.

World Health Organization accepted WHA 63.13 decree in its 63rd World Health Assembly in 2010 and approved global strategy to decrease the harmful usage of alcohol. World Health Organization called member states to adopt and apply global strategy. The application of global strategy to decrease the harmful usage of alcohol was considered as a priority and member states are invited to provide adequate sources and human power for the application of strategy.

Precautions such as limitation of supply (policies against driving, alcohol marketing policies, alcohol taxes, intensity of sale points, limitations on sales hours and days, minimum purchase age) and precautions to decrease demand (early diagnosis in businesses and health services, treatment and rehabilitation programs) are part of alcohol control strategy and they present possible solutions for the aim of decreasing harms related with alcohol.

Obesity is a global health problem. Obesity increase both in developed and developing countries. In the MONICA program of WHO which continued for 12 years executed in 6 different regions of Asia, Africa and Europe, %10-30 increase in the prevalence of obesity was determined in 10 years.

According to WHO statistics, obesity cause total amount of more than 1 million people since it is responsible of % 80 of Type 2 diabetics, % 35 of ischemic heart diseases, % 55 of hypertension. In case no precautions are taken and considering the increase in obesity prevalence will continue with the speed of 1990's, it is estimated that there will be more than 150 million adult and 15 million children obesity cases in Europe. Studies executed so far on the relation between obesity and cancer prove the relation between obesity and colon, endometrial, postmenopausal, breast, kidney, esophagus, pancreas, gall bladder, liver and blood cancers (World Cancer Research Fund Institute Report 2007).

2003 report of WHO defined obesity as cancerogenic but the mechanism of obesity to cause cancer is a very complicated process and has not enlightened completely yet. Among the estimated mechanism, there are hormones related with obesity, growing factors, disorders in energy metabolism, different signal paths and inflammatory mechanisms (Calle and friends 2004, Drew and friends 2012, Dalamaga and friends 2012, Gallagher and friends 2011,Hursting and friends 2010, Chen J. and friends 2011, Harvey and friends 2011)

Beside causing cancer, obesity also causes bad response to cancer treatment, as well as bad prognosis and increased amount of mortality due to cancer (Kaidar-Person and friends 2011, Parekh N. and friends 2012).

Asbestos, which widely seen in nature with its fiber characteristics may directly cause lung cancer and mesothelioma which is the malign tumor of pleura. It also causes permanent functional losses in lung and pleura (asbestosis, diffuse pleural fibrosis). These problems are observed in endemic for the population who has contacted long time with adequate amount of asbestosis. For the coming 30 years, 500.000 people are expected to lose their lives due to asbestosis in developed industrialized countries. Contact with asbestosis is generally realized in industrial areas while today the main problem in our country is environmental exposition in rural areas.

Radon is one of the well-known cancerogenic and comes from the natural sources. It is the second cause of lung cancers after tobacco and is responsible of %3-15 of lung cancers. According to WHO, household radon levels are determined normal up to 200-400 Bekuerel/mm³ and WHO suggests making of cost effectiveness analysis, determining of household radon levels, making of radon maps due to geographical structures and determining of national radon levels equivalents for member countries to choose reformative precautions.

Unfortunately, exposure to radon which has been in the households for many years came to countries' agenda recently. Studies on this subject recently started in European Union countries but there is no sign of national control program in countries rather than Sweden. Sweden announced 2012-2020 Radon Control Program.

There are many scientific studies on UV exposure via solariums. Many of these studies prove the increasing risk of occurrence of skin cancer, statistics and lab experiments on animals also point out that there are cancerogenic effects, thus these are classified as group 1 cancerogenic by IARC in 2009. Health institutions such as CDC, ICNIRP, WHO point out that there should be some restrictions for the use of these devices due to their effects on health, especially due to their cancerogenic characteristics. Many countries prepared jurisdictions on the subject and usage was forbidden under the age of 18.

Electromagnetic areas, wireless internet, cell phones and cancer relation became subject of many scientific studies in competence with developments in technology. IARC has evaluated all scientific literature so far whether low frequency electromagnetic devices are cancerogenic and although there are not definite evidences, classified these devices as "possible cancerogenic" Group 2B. International studies continue on the subject.

Both in Turkey and globally, many substances and materials are discussed whether they cause cancer but independent from the results of these studies, wrong and speculative news are published in the world press. Against these news, reports of NCI, WHO, IARC and some other international health agencies are shared with public in order to increase awareness.

## 2.2. Current Situation in Turkey and Planning

**Tobacco Control Activities**
Cigarettes are the widely used form of tobacco and fight against smoking composes one of the main components of our health policies. The first legal step was taken in 1996 with 4207 numbered law. Tobacco Control Framework Agreement adopted by WHO on 28th April 2004 was signed by Minister of Health Recep Akdag and approved by Turkish National Grand Assembly and came into force, National Tobacco Control Program was prepared.

The most important activity executed within the framework of National Tobacco Control Program 2008-2012 was the "Smoke free Air Space" and it entered into force on 19th May 2008. On October 2010, "171 Quitting Smoking Consulting Hot Line" was established and trained personnel were employed for assistance.

Apart from these, taxes on tobacco products were increased % 80.25, inspections were increased, monitoring processes with GPS and tablet computers were used, written and visual warnings were placed on cigarettes, as well as obligatory public spots were published in mass media, sponsorshipof tobacco companies were forbidden and number of smoking polyclinics were increased to 423.

As a result of all these health policies, smoking ratio which was % 33.6 in 1993, declined to % 27 in 2012. Cigarette consumption per individual decreased % 25.9 in 2010-2011.

Besides 19th July 2009 – 1 July 2010, due to the results of a study performed in Istanbul, % 20 of decrease was observed in applications for respiratory tract infection and asthma attack.

Political determination during the application of the Law and National Tobacco Program is the key of

the success in Turkey. Turkey was awarded 2 times by WHO for its political stability and determination. Finally, Turkey became the first country to meet MPOWER criteria of WHO with the changes in law which came to force 12th July 2012.

Our policies aiming to fight against smoking is continuously renewed due to global standards.

**Turkey Alcohol Control Action Plan**
Within the framework of National Alcohol Control Action Plan, on 10th June 2014 there were amendments on 6487 numbered Law which had been originally adopted on 24th May 2013. With this legal arrangement works on National Alcohol Control Action Plan continuous.

**Turkey Obesity Fightand Control Program**
The purpose of Turkey Obesity Fight and Control Program which was initiated on 2010 is to start an effective action against this disease which has been deeply and increasingly affecting our youth and children, increase the awareness in society about the complications of obesity, encourage individuals to adopt healthy diets and living styles with increasing physical activities and thus reduce the amounts of obesity related diseases (cardiovascular diseases, diabetics, some cancer types, hypertension, muscle-skeleton system diseases).

Furthermore, there are many studies and programs are executed by several public and private institutions, civil society institutions for preventing obesity. Coordination of these studies and managing of efforts within the perspective of a road map is an important aspect of success. Action Plan foresees managing of efforts within a certain schedule and aims to build measurement and effective monitoring.

**Turkey Asbestos Control Strategic Plan**
Our Ministry initiated work on the subject in 2009. Since Turkey is rich of asbestos due to its geographical condition and different from the professional contact in developed countries, Turkey has both intense professional and environmental contacts; thus asbestos analyses are made nation-wide in different regions. Methods followed can be summarized as follows:

- Personnel of Health Directorates visit to villages, interview with citizens and try to determine the places of contact with soil. Directorate, governorship, municipalities and related ministries apply several activities such as painting of determined places, closing of areas where soil with asbestos is brought.
- Especially many houses were painted, for citizens with limited capabilities, they got aid from state offices for painting houses, the roads were asphalted and usage was prevented in many areas while training activities were continued.

National Asbestos Reformation Project initiated in November 2013 by Cancer Directory and Environment Directory of Ministry of Health is composed of two phases. Things executed so far and plans within the scope of this project are as follows:

- Studies were initiated in 30 provinces and in order to manage the studies in these provinces a coordinator was determined among directors, deputy directors, and one coordinator chosen among academicians of "Turkey Mesothelioma Working Group".
- Data for five years on diseases caused by asbestos is demanded from provinces and as a result of evaluation of such data, it was also determined that there were also some diseases in other provinces and thus those provinces were also included in work.
-

Till now, samples were taken from 63 provinces and after preliminary examination in Eskisehir Osmangazi University, they were sent to TUBİTAK for further analysis. Analyses were completed in TUBITAK and second phase of reclamation was given start.

**National Radon Mapping**
After completing calculations in 81 provinces, "Turkey's Radon Map" will be constituted and after development of "National Radon Control Program" is being planned. Within this context;

- Radon Protocol was signed with TAEK in order to execute project in coordination.
- Radon measurements will be undertaken in 81 provinces for the purpose of preparing "Turkey Radon Map" and involved personnel were trained by our Ministry and TAEK.
- By taking addresses of 65.000 households from TUIK on the basis of provinces, measurement of radon was given start in 2015.

After National Radon Mapping project, reclamation will be given start due to the criteria determined by WHOin the area where radon measurement is above standard values.

**Solarium Centers and Solariums**
Many international institutions such as CDC, ICNIRP, WHO and many other health agencies suggest applying of certain limitations to usage of solariums due to their negative effects on health. Since risk of developing of melanoma is high for the individuals under the age of 35, these international agencies suggest limitations under the age of 18.

Many countries made legislative regulations, while some of them partially forbids, others totally forbids the solarium under the age of 18.

Activities of our Cancer Directorate on this subject can be summarized as follows:

- Current literature on solarium devices and their relation with cancer was evaluated and a scientific report was prepared.
- International regulation samples were examined.
- We shared our scientific report with Medicine and Device Institution and we learned that it was out of their jurisdiction since these devices were not considered as medical devices.
- Work for a regulation is given start, involving many issues such as monitoring and licensing of centers with solarium devices, certain limitations of using these devices like restrictions under age of 18 or using devices only with the permission parents.

**Monitoring and Evaluating Effects of Electromagnetic Areas on Health**
Due to current scientific data, there is no clear evidence that base stations or cell phones cause cancer or negative effects on human health. During the installation and operation of base stations in our country, necessary inspection is executed by Information Technologies and Communication Institution (BTK).

Cancer dimension of base stations are being monitored by International Cancer Research Agency operating under World Health Organization. As one of 24 active members of IARC, Turkey closely monitors the scientific developments and shares information with public

**Cancer Reports**
As being one of 24 active members of International Cancer Prevention Agency (IARC), scientific data is being monitored and literature is being screened on subjects and materials which are claimed to be related with cancer and reports are prepared.
Here are some of the examples of our current reports:

- Electromagnetic Areas Cell Phones and Cancer Report,
- Hyperthermia radiotherapy report,
- Homeopathy Report
- Cancer reports on broccoli, ginger, phthalate, formaldehyde, brown sugar, bisfenol, A carboys, food with GDO.

These notices and reports are delivered to press consultancy and regularly shared with public.

**Epidemiological Researches**

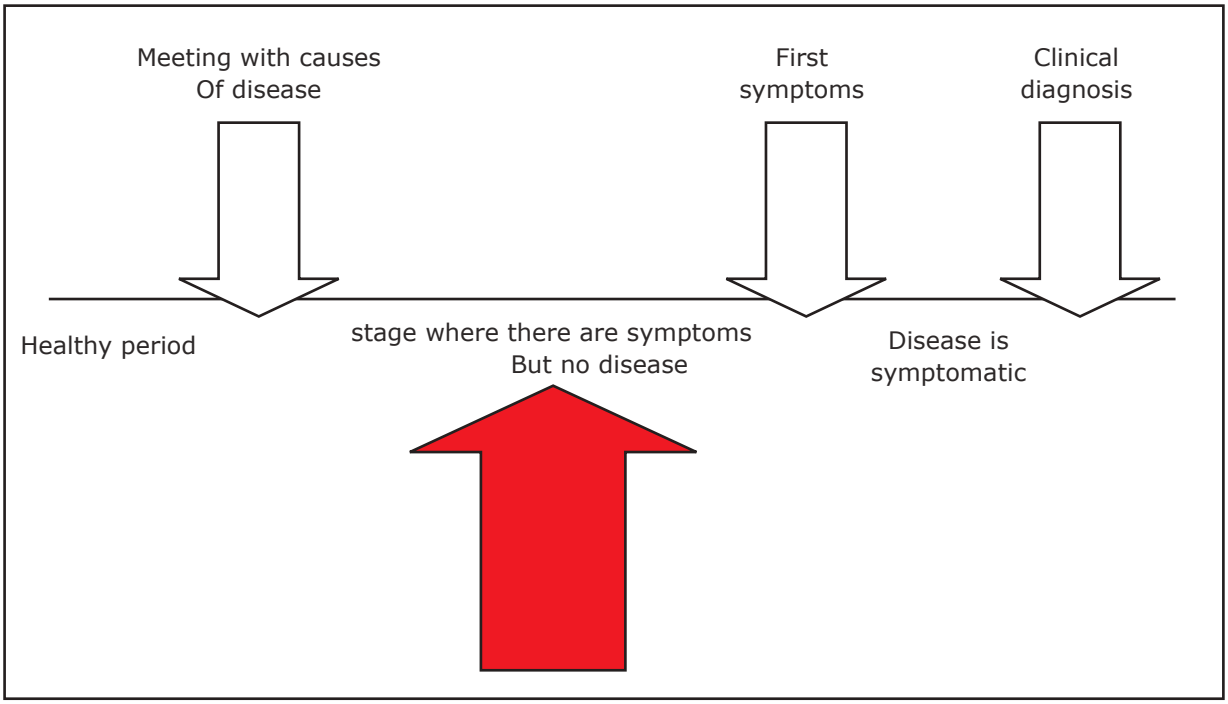
Demands, opinions and complaints of citizens, public and private institutions about the factors that cause cancer are evaluated in our Directorate; answers are prepared after necessary examination and consultation. Within this context, studies executed during 2009-2013 are given in Table below.

**Table 2.1. Numbers ofEpidemiological Researches Executed in 2009-2010-2011-2012-2013**

| YEARS | COMPLETED WORKS |
|---|---|
| 2015 | 14 |
| 2014 | 40 |
| 2013 | 27 |
| 2012 | 12 |
| 2011 | 15 |

## 3.1. What is screening? Why is cancer screening applied?

There are two ways in the diagnosis of diseases. First is to catch the early symptoms of disease, second is to catch the individuals at a stage where disease does not have any symptoms yet. Screening programs are applied to catch individuals prior to symptoms. It is obvious that, healing and treatment of patients whose diseases are diagnosed at early stage are much easier and less costly in comparison with patients at late stages.




Screening is to apply some tests, examinations and other methods to individuals with healthy look in order to determine if there are any undiagnosed, unknown diseases or deficiencies. Screening tests are not expected to establish a final diagnosis. In case of positive or suspicious results of the tests, the cases should be steered to further centers for more detailed examinations. Thus, following screening tests, the society is divided into two as "definite intactus" and "possible patients". But for the screening of diseases in society, some criteria determined by World Health Organization should be met, these are:

- Disease to be screened has to constitute a serious health problem for society.
- Disease to be screened has to have a latent or early symptomatic stage.
- There should be adequate and enough information about the clinical prognosis of disease.
- There should be appropriate treatment methods for the treatment of patients after screening.
- There should be adequate infrastructure (personnel, equipment) for diagnosis and treatment of diseases.
- The tests used in screening programs adopted by the society.
- Besides, tests should be easy to apply.
- Selectivity and sensitivity of the tests should be high,
- Screening has to be continuous.

For screening programs to obtain desired successful results they should be adopted by the society and public contribution should be high. The main factors that affect the contribution of society in a screening program are:

- The society has to have an idea about the disease,
- Public should be aware of the harm of the disease which is screened to public health,
- The individuals should accept that they may also have the possibility to have that disease,
- There has to be a belief that, in case the disease is being diagnosed after screening, the precautions can be taken which may positively affect the prognosis of disease,
- Screening program has to be in competence with target groups,
- Attitude of health personnel towards screening program,
- Cost of screening program.

Many different factors effect the benefits of finding unknown and undiagnosed cases in a society after screening. These are:

- Sensitivity of the test used in screening
- Frequency of the disease which has been screened
- Whether there has been another screening on the same subject
- Behaviors of society related with health.

The screening program is supposed to be more successful, the benefit amount is closer to % 100. Screenings are important components for protective health applications that may decrease the cancer mortality. Cancer is defined as proliferative and invasive structured diseases of hundreds of different tissues that are emerged with molecular mechanisms. Each of cancer diseases has their own etiology, risk factors, and diagnosis and treatment methods. For some cancers (for instance breast, colorectal, cervical and prostate) early diagnosis and screening is suggested while it is not suggested for some other types (for instance pancreas, thyroid and bladder). The issue of applying screening programs for which cancer types is determined due to criteria of World Health Organization (WHO), as well as;

- It has to prove that, to be applied screening method will decrease the cancer load of the country,
- The screening program to be applied must be a part of integrative cancer control program.

World Health Organization suggests society based screening programs in order to catch the cases at early stages for breast, cervical and colorectal cancers. But WHO also points out that, these works have to be a part of an integrative cancer control program.

## 3.2. National Cancer Screening Program applied in Turkey and its Standards

In our country, cancer screenings are executed by Cancer Early Diagnosis, Screening and Training Centers (KETEM). KETEM's operate with the motto "Early diagnosis saves lives!" and execute screening programs related with breast, cervical and colorectal cancers. Currently there are 197 KETEM's in the country and at least one in each province.

In these centers, doctors, nurses, midwifes, x-ray technicians and medical technicians who take necessary training on protection and screening for cancer, are employed. Employees are also trained on communication and health education. For screenings of cervical and breast cancers, women are invited (by letter or phone) for necessary examinations and tests. Colorectal cancer screenings started in 2013.

Globally, national screening programs do not exist and suggested for lung, stomach, skin and prostate cancers. Our Head Directorate keeps in touch with national and international stake holders, makes plans of developing new policies by following scientific literature, updated data and cancer statistics of the country. Within this context, there might be regional pilot projects for other cancer types in the future due to scientific developments.

## 3.3. Family Practitioners and Cancer Screening

Today in our country, family practitioners are the ones who give service to closest to residence of individuals, who are aware of the health and living conditions of all family members, thus who know best how to apply protective health practices and health training for individuals. Family practitioners evaluate individuals under their responsibility not only within a scope of a certain disease but within an integrative approach composed of risks, health conditions, psychosocial environment and current other acute or chronic health problems. In our country, our main target is to present health services for protection, diagnosis, treatment and rehabilitation of individuals in the closest area to their residences by family practitioners. Family practitioners are the closest ones to individuals in the society since they work individual oriented, as well as they present sustainable service to families and society. Family practitioners build relations based on mutual trust and evaluate problems with their physical, psychological and social aspects.

Most important criteria for cancer screenings to be society based, is the execution of program that contains more than % 70 of the population. The only way to reach to the targeted population is the integration of family practitioners to the program. In cancer screening program, family practitioners have key functions in;

- Explaining of the program to society as well as increasing the contribution,
- Inviting of targeted population to the program,
- Communicating of screening results to society.

Thus, family practitioners definitely have to be involved in screening programs and should be supported on this subject.

# BREAST CANCER SCREENING

Breast cancer is the most common cancer type in women and the first in mortality. Incidence of breast cancer increases in relation with age, furthermore, since the incidence increases in many western European countries, mortality ratios stay stable or in trend of declining. In our country, breast cancer incidence is 46.8 in hundred thousand and each year approximately 17.000 women are diagnosed breast cancer (1). Stage at the diagnosis is an important factor to determine the method of treatment as well as breast cancer mortality and healing ratios.

For 2008, there are 2.6 million women with breast cancer in US. For 2012, approximately 226.870 women were diagnosed invasive breast cancer and in same year, 39.510 women lost their lives due to breast cancer (2). Considering all death causes in Turkey, we see that cancer is the second cause both for men and women with the relatively ratios of % 15.04 and % 10.74. In Turkey for 2000, 21.174 died because of cancer (3). In our country, breast cancer is at the 8th place among the most frequent 20 diseases with the ratio of % 2.1 (3). With this ratio, mortality of breast cancer in Turkey is higher than US (4). Breast cancer is a progressive disease,life expectancy is high in case of early diagnosis. In countries where early diagnosis and treatment are developed, for the patients diagnosed with breast cancer, the ratio of 5 years of survival is about % 90-95 (2). With the help of screening activities for breast cancer, % 63.7 of breast cancers can be diagnosed at early stages. For the patients diagnosed in this stage, 5 years of life expectancy is % 97,9 (5). Considering these, breast cancer has the longest life expectancy and best prognosis among the frequently seen cancers such as lung, colorectal and stomach. But this also raises another issue of long life expectancy with cancer.

Although breast cancer is the second frequently seen cancer following lung cancer, since it is usually seen in younger populations in comparison with other cancers, it causes more life time loss(6). For an average woman, risk of being breast cancer during her life is % 7,8 and ratio of mortality is % 2,3 (7). Breast cancer mortality declines in industrialized countries where standard mammography screenings are applied. Some think this situation is the result of developments in treatment while others believe that early diagnosis facilitates the treatment options (8). Despite the ongoing mammography screening activities, most of the breast cancers in our country are diagnosed at late stages. An effective screening should involve at least % 70 of the population and this is possible with society based screening programs.

National Turkish Guide suggests the start of screening at the age of 40 and ends at the age of 69 and applied once in two years. Targeted population for screening is about 12 million people. Today, the current containment amount in screening programs is about % 30-35. Society based screenings are executed by Cancer Early Diagnosis, Screening and Training Centers (KETEM) . Opportunity screenings are applied to women who apply to hospitals. Despite awareness and training activities, problems are evaluated in relation with low screening ratios, inadequate numbers of experts, problems related with access to service and lack of awareness are determined as main causes. In order to solve these problems, first of all family practitioners are integrated into screening program, pilot projects involving the invitations of experts for the targeted population at family health care centers are applied in Cankiri, Izmir and Erzurum. Pilot projects prove that, integration of family practitioners to screening program has positive effects on increasing awareness.

There are some problems due to lack of x-ray technicians to apply mammography and technicians to interpret the graphs, personnel employed in hospitals can no longer be employed in KETEM's after 663

numbered law, unable to separate diagnosis and treatment phases. Furthermore, it is known that screening intervals are longer in rural areas and geographical distribution of population also negatively affects screening services.

Related with the solutions of problems of access to services, insufficient numbers of experts and awareness, "Mobile Mammography Project" has been planned. Thus, screening activities will be executed via mobile KETEM's and the main role in this project will be undertaken by family practitioners. In 81 provinces, Mobile Mammography vehicle will park at the gardens of family primary care centers and people invited by family practitioners will be applied screening. In this project, five years of service purchase has been planned, thus the problem of insufficient numbers of experts is tried to be solved by private sector. Also, establishment of central reporting unit will enhance more productivity of limited number of radiology experts. Mammography results issued by the central reporting unit will be sent to automation system of family practitioners. Thus, patient will apply to the nearest health unit for the results; he will no longer need to go KETEM for screening. Pilot application is decided for this project and service was purchased for mobile units for the 8 pilot provinces.

X-ray technicians and radiology experts who will be employed within the scope of the project are planned to be trained. Quality and productivity of the service in this project will be monitored by our institution in cooperation with profession chambers such as Turkish Radiology Association. Organization of the program will be managed by Public Health Directorates while mobile units will be planned to pay visit every location twice in a year.

After the project is given start, our target is to reach % 50 in opportunity and society based screenings. We expect the early phase (Phase 0,1) breast cancer diagnosis ratio to reach over %50 in the third year of the project. Besides, the number of cases steered to hospitals for additional examination should not surpass % 10 of all filming. For determination and monitoring of these data, data transfer system of contractor company and e-health system will be used. We hope the amount of attendants to screening will reach % 70 at the end of 5 years.

Within the scope of the project, establishment of Post Screening Diagnosis and Treatment Centers in total 30 hospitals of 23 provinces is planned for 2014. These hospitals are chosen among state and university hospitals in accordance with 2011 Oncology Treatment and Investment Planning Report. There will be purchases from 2015 budget to fill the deficiencies after evaluating device infrastructure to be used in diagnosis and treatment of breast cancer. For the training of the personnel of these centers, cooperation will be established with profession chambers such as Breast Associations Chambers, Turkish Radiology Association. Thus, the patients will have the chance of diagnosis and treatment in their regions in post screening period.

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# CERVICAL CANCER SCREENINGS

## 5.1. Global Current Situation

Cervical cancer is the third frequent cancer for woman following breast cancer and colorectal cancer (1). Thanks to long term successful applications of cervical smear screenings, in many countries morbidity and mortality in cervical cancer decreased more than % 70 (2). Success is obvious in some developed countries where screening activities are commonly applied. In the developing countries screening is not applies systematically and in large extend, thus cervical cancer still causes several deaths. Today, % 90 of deaths due to cervical cancer is realized in developing countries.

In Europe, in Eastern Europe and Balkans, incidence of cervical cancer is high. In these countries annual incidence is 24-40 in hundred thousand. On the other hand, in Western and Northern European countries, annual incidence is below 16 in hundred thousand. In global, African countries, India, Central and Southern American countries are the places where disease is frequently observed (Figure 5.1, Table 5.1)

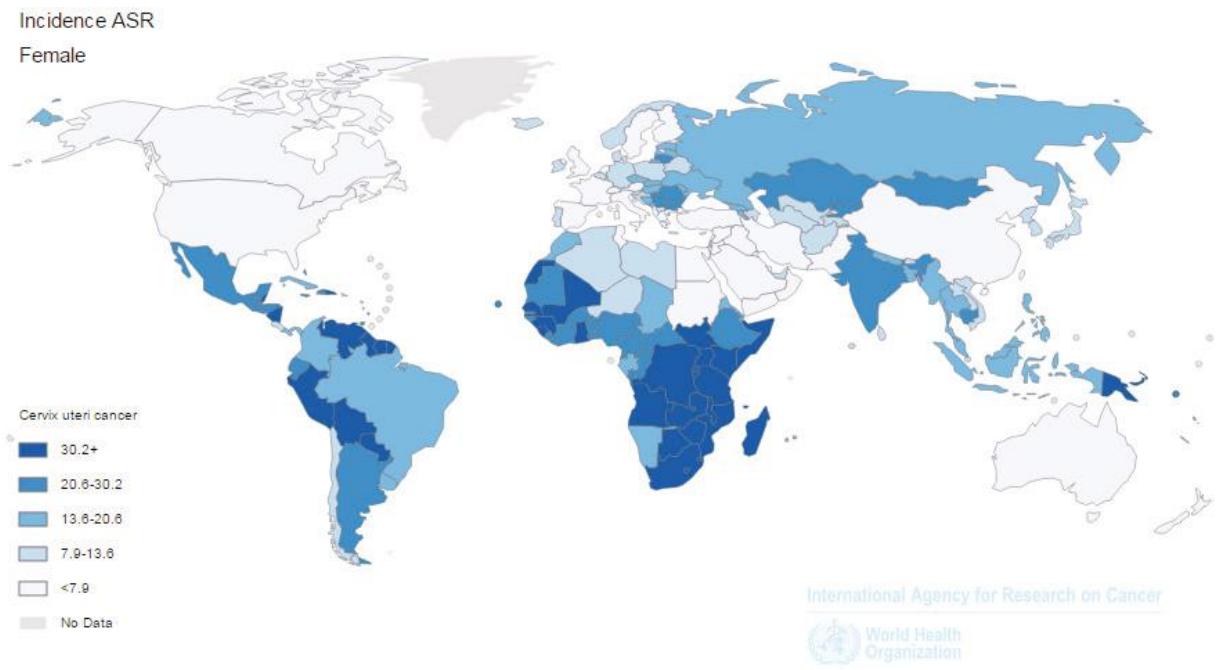


**Figure 5.1. Cervical Cancer Incidence Globally (Globocan 2012**

**Table 5.1. Global cervical cancer incidence (Globocan 2012)**

| | | İnsidans | | | İnsidans |
|---|---|---|---|---|---|
| Name of country | Num. of case | Standardized Speed, ASR | Name of country | Num. of case | Standardized Speed, ASR |
| Iran | | 2,8 | Azerbaijan | | 9,8 |
| Malta | | 3,8 | Macedonia | | 12,4 |
| Turkey | | 4,3 | Bosnia-Herzegovina | 359 | 13,7 |
| Finland | | 4,3 | Brazil | | 16,3 |
| Israel | | 4,6 | Latvia | | 17,3 |
| Albania | | 5,0 | Hungary | 1.178 | 18,0 |
| Greece | | 5,2 | Moldavia | 475 | 19,5 |
| Canada | | 6,3 | India | | 22,0 |
| US | | 6,6 | Kyrgyzstan | 641 | 23,7 |
| Italy | | 6,7 | Serbia | | 23,8 |
| Netherland | 750 | 6,8 | Bulgaria | 1.254 | 24,5 |
| France | | 6,8 | Lithuania | 615 | 26,1 |
| UK | | 7,1 | Romania | 4.343 | 28,6 |
| Sweden | | 7,4 | Kazakhstan | 2.789 | 29,4 |
| Spain | | 7,8 | Gina | | 38,4 |
| Iceland | | 7,9 | Tanzania | | 54,0 |

**History**

Cervical cancer is the unique cancer of which etiopathogenesis had been enlightened and which is preventable (3). In terms of screening, the most important success of preventive medicine is the control of cervical cancer. In the beginning of 20th century, cervical cancer that took one of five of every women, used to be named as "disease that left orphan". Because most of women diagnosed cervical cancer were mothers and most of them used to lose their lives in a year following the diagnosis.

Following the invention of microscope and definition of Greek pathologist Papanikolau that years prior to cervical cancer, the existence of abnormal cells in the cervical of women, mortality rate declined significantly.

Cervical cancer which can be treated with screening and early diagnosis, is one of the rare causes of deaths due to cancer. It is possible to say that, any women who regularly go to screening will not die due to cervical cancer. Thus World Health Organization (WHO) suggests screening for cervical cancer in all countries (4). Screening method and screening internals may differ in countries (5). Definite suggestion is the screening of a woman once in a life time between the ages of 30-65 with an appropriate screening method for cervical cancer. Due to the conditions of country, screening method:

- Cytology (cervical smear)
- HPV Test
- Cytology/HPV contesting (both two tests once in 5 year)
- VIA/VILI (asetic acid or visional examination with Lugol)
- See and Treat (excisional biopsy from suspicious cervical with a method like leep).Screening intervals may be once in 2, 5, 10 years or once in a life time due to the conditions of country. But in any way screening is not suggested not frequent than 2 years. The 3 year interval of screening with smear with two negative results in a row, triples the invasive cervical cancer risk (6).

Today, although there is not a clear cervical screening strategy that can be adopted by all countries, with the condition of adequate quality, smear in every two years, co-testing once in three years or primary HPV test once in five years but not before the age of 30 is suggested as screening (7,8).

**Why is Cervical Cancer Important?**

- Cervical cancer is a preventable disease.
- Cervical cancer can be % 100 treated with early diagnosis.
- Deaths due to cervical cancer can totally be prevented.
- It is possible to say, a woman, who is applied cervical screening will not die due to cervical cancer.
- Cervical cancer is a disease of which pathogenesis is completely enlightened.
- Cervical cancer has a carcinogenesis (transferring into cancer) duration of 10-20 years and in this period it is possible to identify the facts that may turn into cancer.
- The number of women dying due to cervical cancer is inversely proportional with development level of that country in terms of health services and importance attributed to women in such society.

**VIA/VILI**

With the observation of cervical under acetic acid or Lugol, it is suggested in countries with limited capabilities for screening. This method allows application of biopsy from the areas painted with abnormal acid or Lugol in cervical. At the same time, leep or crio excision can be simultaneously applied to the cervical of suspicious cases (see and treat). The most important risk of this application is that there are many variations and the absence of standards. One other risk is the problem of productivity for women after this application to cervical (7). It is known that see and treat method increases 2.5 times the prenatal morbidity. But; it is the suggested screening and treatment method for the countries with high cervical cancer mortality with limited capabilities.

**Smear Test**

Cervical smear test is composed of microscopic examination of painted cells derived from cervical. Screening is suggested for every sexually active woman between the ages of 20-65 once in two years. In the prevention of hundreds of thousands of lives, this test defined by Papanikolau played an essential role for more than 50 years.

Furthermore, cervical smear test does not reduce cervical cancer risk to 0 with general society screening (8). Society based screening with cervical smear can be successful only if has very high quality. Quality criteria in cervical screening contain both standardization of smear test and contribution ratio of the society. The higher the smear test standards and the more the contribution of society, the more qualified the screening is. The contribution of at least % 70 of the society is an essential condition for screening.

Besides its success in controlling cervical cancer, cervical smear test with %50 sensitivity ratio, does not allow for an interval more than 2 years (9). Again, it won't be wrong to say every woman who applies smear test once between ages of 30-65, reduces 3 times her mortality due to cervical cancer.

This and other restrictions of smear test cause the search for some alternative tests. In recent 20 years, enormous increase in scientific developments enlightened the phases of development of cervical cancer. Today, it is known that, cervical cancer is % 99.9 caused by HPV (Human Popilloma Virus) (10). Determination of HPV points out precancerous changes in cervical at early stage and facilitates the cancer diagnosis. Today, HPV tests take more place in cervical screenings.

**HPV Test**

It is a test based on determination of HPV genetic material in cervical cells. Since HPV infection is limited in epidermises, it does not compose a humoral immune respond. Thus it does not have an antibody that can be determined in blood circulation. HPV diagnosis can only be possible in infected tissue with determination of HPV DNA or DNA products by molecular methods.

After serving of HPV tests to market in 1990's, there are many findings that cervical cancers are diagnosed clearly at earlier stages.

Meta analysis proves that, in comparison with cytology, HPV test is more sensitive in determining preinvasive cervical lesions (Figure 5.2). It is pointed out that, especially for women over the age of

30, sensitivity is more apparent in comparison with cytology and for specificity, it is also comparable with cytology. Finally, addition of HPV test to primary screening after the age of 30 is considered cost effective. Besides, HPV has a very high negative estimation, this means if a women is HPV negative, it is a very strong possibility she will not be a cervical cancer until her following screening test.

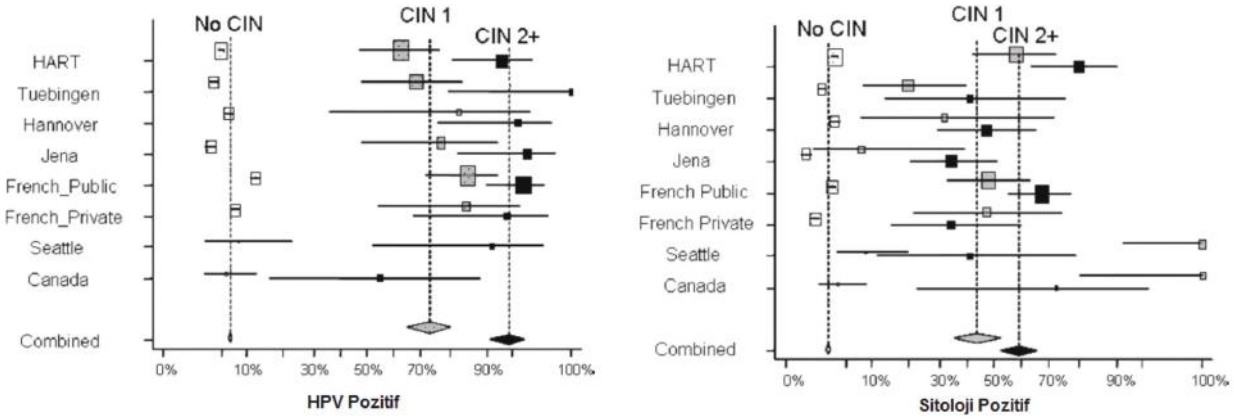


**Figure 5.2.Meta analysis pointing out sensitivity of HPV positivity (left) cytology positivity (right). On the left, HPV positivity is shown and on the right, success (sensitivity) of cytology positivity on determining cervical invasive lesions. On y-axis, analyzed studies and on x-axis sensitivity ratios (%) are defined (11).**

With the publishing of encouraging results of first meta analysis which point out that cervical screening can primarily be done with HPV test, screening with HPV test works are designed prospectively with big cohorts (11-15). When 10 year results of these studies are published, HPV test is started to be suggested for screening activities (16). Due to this any case of which HPV test is negative, has a very low risk of invasive or non invasive cervical cancer risk in the following 10 years (Figure 5.3). Addition of cytology to HPV test would only result % 5 increase in sensitivity while was decreasing specificity to a significant amount.

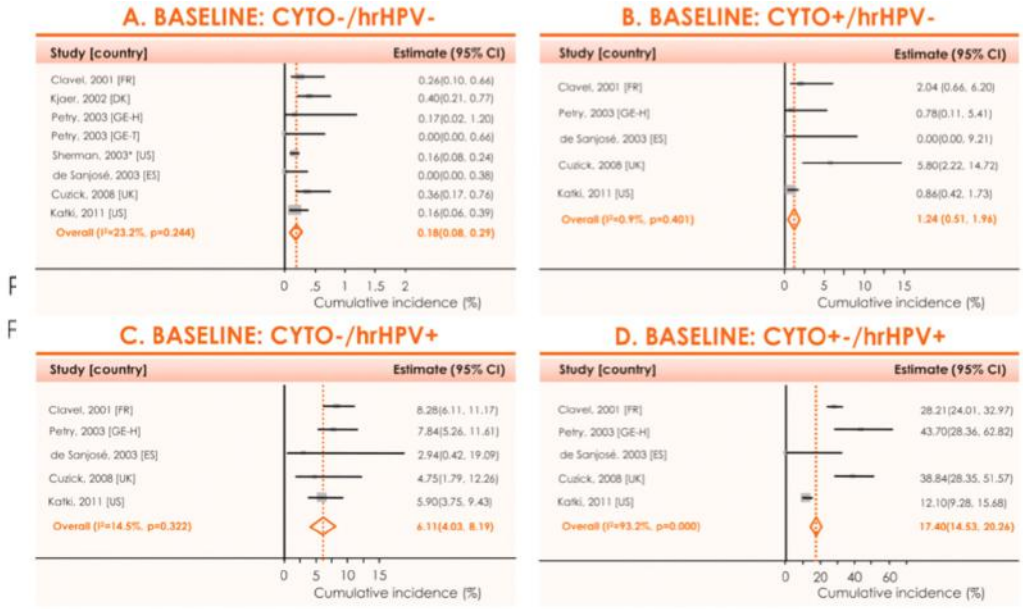


**Figure 5.3.Meta analysis of works of which 10 years results are published. (A) total cancer risk of the cases both cytology and HPV tests are negative. (B) Total cancer risk of the cases where there is cytology abnormality but HPV test is negative. (C) Total cancer risk of the cases where cytology is normal but HPV is positive. (D) Total cancer risk of the cases where both cytology and HPV tests are normal (16).**

## 5.2. Current Situation in Turkey and Planning

**Cervical Cancer in Turkey**
According to 2012 data of Cancer Department of Ministry of Health, Age Standardized Rate (ASR) of all cancers for women is 188,2 in 100.000, while 4.5 in cervical cancer (17). This means number of women with cancer are 1695 annually and cervical cancer composes % 2,3 of all cases.

For women, cervical cancer in our country stands 10th at the list following breast, thyroid, colorectal, uterus corpus, lung, stomach, ovary, non-Hodgkin lymphoma and brain cancers (Figure 5.4).

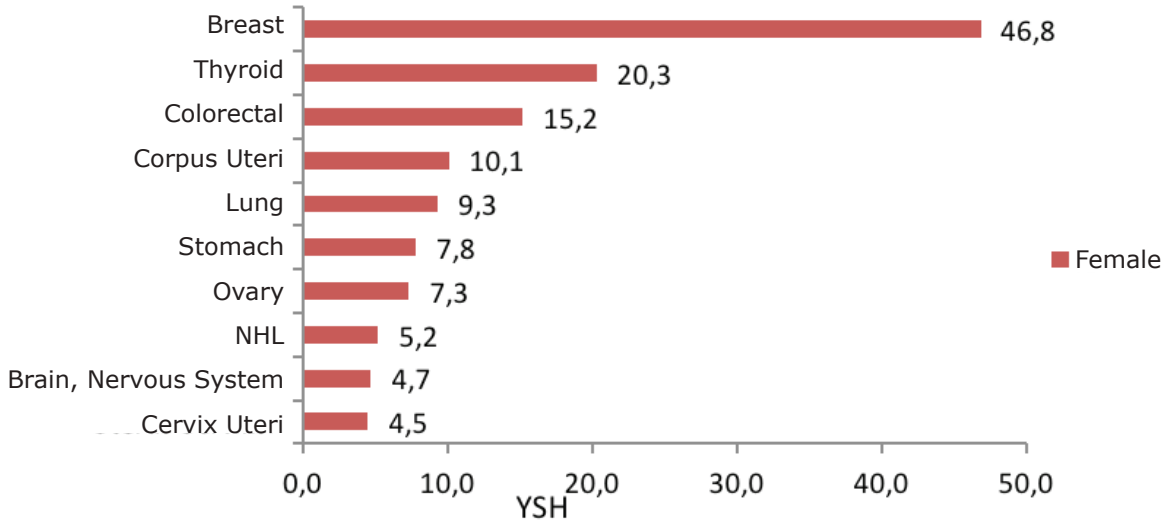


**Figure 5.4. Distribution most frequently observed top 10 cancers due to standardized age (united data base, 2012) (World Standard population, in 100.000 population)**

The average age of cervical cancers in our country is 48,7 but unfortunately most of cases ara diagnosed at late stages where there is not curettage option.

**Cervical cancer screening in Turkey**
Although cervical cancer does not compose a very serious threat in our country, in competence with recommendations of World Health Organization (WHO), cervical smear has been applied since 1992. Cancer Department which has been adopting the recommendations of WHO, has planned for the application of cervical smear once in 5 years for all women between the ages of 30-65 in nation wide established 124 Cancer Early Diagnosis, Screening and Training Centers (KETEM). Unfortunately, in 20 years this application is still so far away from %70 containment rate due to many factors such as indifference of experts, lack of awareness in society. Only % 20 of the targeted women could be taken into the scope of screening program.

Cancer Directorate General, by closely following the global scientific literature, decided to change its strategy in order to overcome above mentioned obstacles. National and international institutions were asked for their opinion. In December 2012, in the scientific commission meeting, it was decided that cervical screening would primarily be applied with HPV tests. According to the renewed national cancer screening standards, every women between ages of 30-65 will be screened with HPV test once in 5 years and positive cases will be reexamined with smear.

Here are some of the national associations that delivered opinion for HPV screening:

- Clinical Microbiology Professionals Association (Klimud)
- Turkish Gynecologic Oncology Association
- Cervical Pathologies and Colposcophy Association
- Turkey cytopathology Association

Again, here are international institutions and experts that delivered opinion:
- European Gynecologic Oncology Association (ESGO)
- International Cancer Research Agency (IARC)
- World Health Organization
- Marc Arbyn, Xavier Bosch, Chris Meijer

There was consensus in opinions that screening with HPV test will be a cost effective option especially to increase the comprehensiveness of cervical screening.

Pilot studies were undertaken on the subject. In Turkey, in asymptomatic women, HPV positivity was determined as % 3. Planning was made for the management of positive cases.

It was decided to take HPV tests in family health care centers. Information of HPV tests were issued in family practitioners information system with ID No and reporting conditions were determined. Monitoring of positive cases were planned, thus one of the most criteria was met.

Clinically, there were studies on a test with world standards and screening began in 2014.

**Results to be obtained from HPV Screening**
- HPV test is more sensitive and can be repeated, thus result will be open to evaluation for a longer period of time.
- Since HPV test negative has high amount of prediction, it will bring confidence to women till the following screening.
- Screening interval may be extended to 7-10 years due to studies.
- In the future, HPV tests will be self-applicable.
- The HPV map of Turkey will be built and a possible vaccine program can be constructed.
- Turkey may be the first and unique country where cervical cancer is eradicated.
- Highly costly expert opinions and information will be used in a cheaper way.
- Since educated and qualified human source is limited, limited sources will be nation-wide used in the most economic way.
- For cervical cancer to be caught in the early phase individuals will have more productive and qualified life as well as high budgeted surgeries will be prevented.
- Research and Development activities may be executed with the help of smear bank data; thus very important source of information with high economic value will be obtained.
- World wide developments will be caught on smart auto systems which were already applied but application areas and methods were not clearly defined in some countries, maybe research and development of a technology that may turn into an economic asset will be made and even information and knowledge may be exported.

## 5.3. Result

Cervical cancer screening is important component of preventive medicine. The cervical screening has been applied in our country more than 20 years and will be continued with higher amounts of contribution of women. Turkish cervical screening program contains unique data due to several characteristics. Screening program, of which preliminary results are obtained in 2015, will constitute an example for many other countries.

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# COLORECTAL CANCER SCREENING

## 6.1 Current Situation Globally

Approximately one million colorectal cancer (CRC) diagnosis are made annually while 500.000 patients die due to CRC (1). According to 2012 data of Ministry of Health, CRC incidence stands at the 3rd place with 24,7 in men and again in 3rd place with 15.2 in women (2). Colon tumors grow slowly, thus the disease has already been in a late stage when they become symptomatic (3,4). CRC diagnosis is made only at % 40 of patients at early stage (localized disease stage). Prognosis is closely related with the stage during the diagnosis. Cancer can be recognized in patients without symptoms but in order to realize this, society should be informed and screening programs should be applied. As the results of screening, it is more frequent to diagnose early stage tumors as well as precancerous lesions. Studies prove that, screening and monitoring decrease the ratio of CRC mortality (3,4,5). For a successful screening program, awareness of doctors on the issue, determining of risks, suggestions in accordance with guides, early diagnosis, canalizing to treatment within the shortest possible time and following up the patients are essential (5).

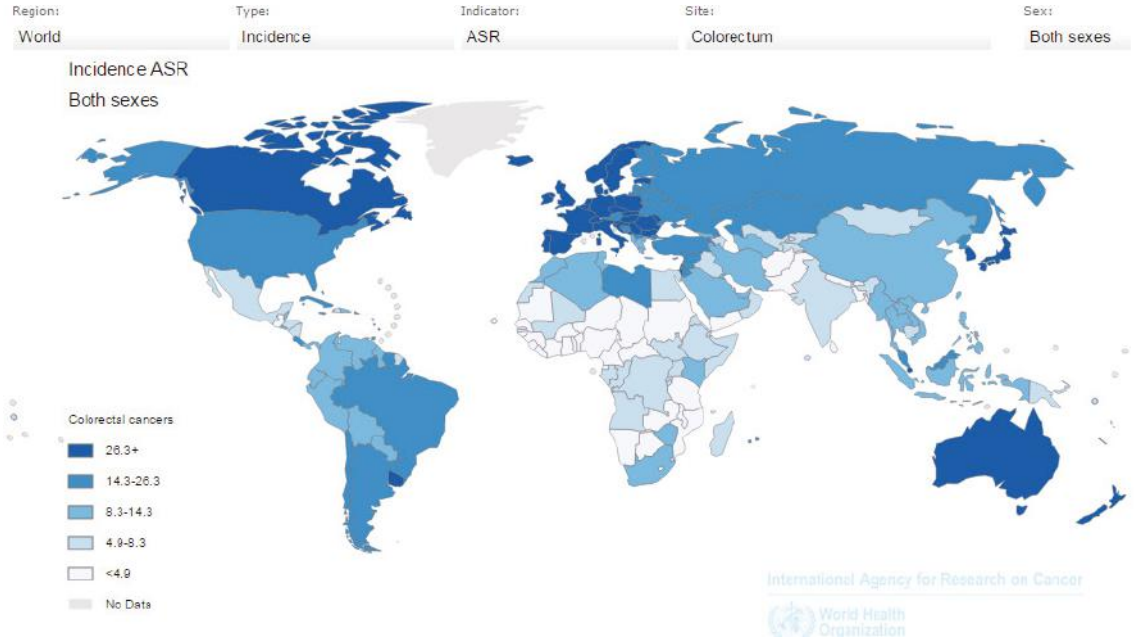


**Figure 6.1. Global colorectal cancer incidence (Globocan 2012)**

## 6.2 Epidemiology and Incidence

CRC incidence and mortality are facing with substantial change (5). While approximately one million CRC cancers are diagnosed annually, 500.000 patients die due to CRC (1). The highest incidences are observed in North America, Australia, North and West Euro, while incidences are relatively low in developing countries of Asia and Africa (6). This seems to depend on geographical differences in diets, environmental factors and genetic predisposition (7). For sporadic CRC, age is the biggest factor. While CRC is very rare under the age of 40, incidence starts to increase after 40-50 of age. %90 of CRC cases are above the age of 50, after the age of 80, this risk rises up to %10 in men and %15 in women. Life time prevalence for CRC is % 2, 4-5. This ratio may rise due to some risk factors for individuals.

## 6.3. Colorectal Cancer Risk Factors

Some genetic and environmental factors increase the developing possibility of CRC (9). Although the highest risk is genetically, most of CRC's are composed of sporadic cases rather than family cancers (10). Common family cancers are Adenomatosis Polipozis Koli (FAP) and Herediter Non-polipozis colorectal cancers (HNPCC), but they only compose less than % 5 of CRC cases (11).

## 6.4. Risk Factors that may Affect Screening Implications

History of colon cancer in the family, adenoma in individual or in his family or CRC diagnosis or any inflammatory intestinal diseases may change screening implications (12).

## 6.5. Adenoma/CRC History in Family on Individual

Those who have the history of CRC or adenomotosispolips have the increasing CRC risks. For the patients who were applied one based CRC resection, ratio of development of metachoronous primary cancer is between 1,5-3 (13). Villous/tubuvillous polyp (especially in high numbers) and adenomatosis polyp above 1 cm increase CRC risk. It is known that many numbers of isolated tubular adenoma do not cause an increased risk (14). History of family is a risk factor besides symptoms that are subject of genetic predisposition. In case of one CRC history in first relatives, CRC development ratio in comparison with general population increases 1.7 times. This ratio increases if there are more than one relative with CRC history and if the age of diagnosis is below 55 (15). In case there is adenoma or villous/tubuvillous adenoma over 1 cm in family history, there is the risk increase as if there were CRC history in the family (13).

## 6.6 Inşammatory bowel disease

There is a strong relationship between ulcerative colitis and neoplasia. This relation is also in line with severity and duration of disease. Pancolitis, increases the risk 5-15 times in comparison with general population. Left sided disease is related with triple times relative risks, while no meaningful risk increase is observed in alone proctitis (16). Annual CRC incidence for individuals with the history of inflammatory bowel disease of over 20 years is about % 0,5. The ratio for the coming years is %1. According to many searches, synchronization of ulcerative colitis and primary sclerosantcholangite increases the risk (17). Many sources also evaluate pseudo polyps, especially big and complex ones as an independent risk factor for CRC (18). Also, there is a relation between activeness of disease, dysplasia and cancer risk (19). According to few sources, there is relative risk increase relation between pancolitis dependent on Crohn disease and colon malignity (20). Systemic inflammation occurs in these diseases also compose a risk factor for CRC. In a controlled study it is determined that increased C-reactive protein level for the patients with low risks is related with increase in CRC risk (21). But this relation is not determined by some researchers (22).

## 6.7. Risk Factors that Do Not Change Screening Implications

There are many factors that are related or less related with CRC deriving from environmental factors and life-style changes. Although these relations are pointed out with visual studies, there is not an accurate proved relation between them (12). Many evidence points out that DM is related with increased risk in CRC (23). In as meta-analysis composed of 15 studies (six case-control, nine cohort) of total numbers of 2.593.935 cases, it is seen that CRC risk rises % 30 in diabetics in comparison with patients that are not diabetic (24). Some studies also point out relation between right colon cancers and cholecystectomy. After cholecystectomy, a small amount of increase is observed in right colon tumors in 278,460 patients who are followed for 33 years (1,16 times). Many meta-analysis build this relation between right colon tumors (25). There are also signs of relation between alcohol consumption and increase in CRC risk

(26). Two large prospective cohort studies also prove that, obesity increases
CRC development risk 1,5 times (27,28). Obesity also increases the CRC mortality ratios (29). Coronary artery disease is also another risk factor for CRC (30). Underlining factors are not clearly seen, but sharing of common risk factors may cause an increase in risks (12). Smoking is related with both increases of risks as well as mortality in CRC. Smoking is also a risk factor for adenomathosispolyph and high risky polyph (big and dysplasic characteristics) (31). Ureteroscolic anastomosis after large bladder operations, increase the risk of formation of neoplasia in the area close to ureter estuary (32). Many studies point out relation with increased CRC risk with consumption of red or processed meat, especially with left colon tumors (33). Connection between CRC risk and caffeine consumption is not clear. Relation between colon cancer and non family BRCA gene mutations is not clear. It is known that, for BRCA1 mutation carriers have double has double colon cancer risks (34). In a large data based study, it is pointed out that radio therapy for prostate cancer is related with rectal cancers (35). Some studies also show the colorectal neoplasia risk increase for the HIV positive patients.

## 6.8. Should Colorectal Cancer be screened?

Colorectal can respond to treatment in case it is diagnosed at an early stage. Early diagnosis in colorectal cancer does not decrease the ratios of mortality and morbidity but also decreases the treatment costs as well. The only way to make early diagnosis of colorectal cancer is to catch the disease in asymptomatic phase by screening programs. In screening programs, fecal occult blood test, sigmoidoscopy, colonoscopy and imaging systems are used. Within the scope of this information, early diagnosis is extremely important to avoid deaths from colorectal cancer and for the application of treatments. The early diagnosis can only be obtained by qualified and efficient screening programs.

## 6.9. Methods used in Colorectal Cancer Screenings

**Tests in colorectal cancer screening**

**Fecal occult blood tests**

Fecal occult blood tests (FBT) have some disadvantages. FBT's are not good choices in screening polyps that do not cause bleeding. Test is more sensitive towards cancer rather than high levels of polyps. Also is FBT tests are positive, than these fake positive results should also be evaluated (36).

**Guaiac Based Fecal Occult Blood Test**
Existence of hemoglobin in fecal is exposed with peroxidase reaction (36). Single test is not enough for CRC screening (37). Screening has to be exercised in three tests in row each of which are composed of two samples (38). Guaiac based fecal occult blood test has variations like Hemocult, Hemocult 2, Hemocult SENSA (HS) and Hemocult R. For CRC, HS is more sensitive and less specific than Hemocult (39). Sensitivity of HS in CRC is %64-80 (40) while sensitivity of Hemocult 2 is % 98-99 (41). Due to the concerns on adaptation in annual screening, 2008 guides do not suggest tests with sensitivity less than % 50 (42). Thus, more sensitive HS test is suggested in screening (43). In a study executed by Anne Kershenbaum and friends published in European Journal of Cancer (2012) HemaoccultSensa was used and in FBT % 4.2 (+) was found in 382.463 patients. This ratio was not repeated in any other centers. Positivity ratios of these tests are at % 15-25 levels. Thus it is not suggested in society based screenings since it requires unnecessary and high amounts of colonoscopy (36).

**Immunochemical Tests in Fecal Occult Blood Screening**
It is more specific than other FBT's since they only screen human hemoglobin (36). These tests are divided into two as quality (normal, abnormal) and quantity. Sensitivity of immunochemical test decreases due to the delays in processing (decomposition of hemoglobin) (44). Positivity ratios of these tests vary from % 5-7. Immunochemical test is more expensive than other FBT's, but since it has less wrong positivity ratio and require less colonoscopy, it is one step forward of others due to cost effectiveness (36).

In an article published in 2011, Jannake A. and friends studied on the answer of question how to decrease the need of colonoscopy in countries with limited colonoscopy infrastructure and searched with which test FBT positivity could be decreased. If the number of colonoscopy is considered adequate, they suggest at least 50 ng/ml hemoglobin measurement, if not, 200 ng/ml hemoglobin measurement. They also declare these values can only be obtained by immunological quantitative tests. Thus; benefits of immunological quantitative tests carry the hemoglobin measurement levels to a higher degree in countries where numbers of colonoscopy devices are relatively less. The limit suggested by World Health Organization (WHO) is 50 ng/dl. Studies also suggest that there is not a meaningful difference among both two hemoglobin levels as well as lesion sensitivity.

**Fecal DNA Test**
Commercial DNA fecal kits include DNA panel. Since all genetic abnormalities related with CRC can not be included in DNA test, it has wrong negativity. Sensitivity of a single test for CRC is % 62-100, for high adenoma % 27-82, specificity % 82-100 (45). This test is expensive (46). Screening interspaces are not certain, in current practice; test is repeated once in five years (36).

**Double Contrast Enema with Barium (DCEB)**
In this survey, intestinal mucosa is covered with barium, air is delivered to colon with rectal catheter and many graphs are taken under fluoroscopy. Intestinal preparation is made for patients before survey. Generally sedation is not applied. Patients may feel pain like cramps during the process, but may return to work after process (36). DCEB may determine half of the big adenoma bigger than 1 cm and % 39 of all polyps (46). Retrospective studies point out that, DCEB's miss % 15-22 of CRC's (47). In case of abnormal finding, biopsy with colonoscopy or excision should be applied. Abnormalities may derive from wrong positivity of fecal content, air or other mucosal abnormalities. Among the advantages of DCEB, examination of whole colon and safety in terms of complications can be told (36).

**Sigmoidoscopy**
60 cm of flexible sigmoidoscopy is able to reach splenic flexura. When colonoscopy is applied to patient after finding of polyps in sigmoidoscopy, additional neoplasms are found in % 20 of the patients. Only cases where tumors on proximals may be missed in sigmoidoscopy screening (48). Preparation of patient is easier in comparison with colonoscopy and BT colonography. Process can be applied without the requirement of sedation. The most important complication is perforation. Perforance ratio in sigmoidoscopy is % 0.08 (54). While small adenoma can be taken in sigmoidoscopy, adenoma bigger than 1 cm are taken in colonoscopy applied after sigmoidoscopy (41). Talking about technical difficulties, especially for women and old patients sigmoidoscopy may not reach to necessary depth (49). Due to European Union quality criteria, it is no longer recommended in screenings.

**Colonoscopy**
It has many advantages in comparison with other tests such as directly visioning of colonic mucosa, possibility of biopsy, capability to take polyps and local tumors. American Gastroenteralgia College defines colonoscopy as a preferred screening test whenever it is available (50). Proximal lesions can be caught with colonoscopy while they may be missed by sigmoidoscopy (51). Screening with colonoscopy carries more risks than screening with sigmoidoscopy (48). Ratio of perforation and major bleeding and major complications is % 0.1 (52). Colonoscopy survey is expensive. Sedation is applied to patients during the process. Patient can not endure his daily activities after the application and needs company on his way home (53). Although they are not trustworthy and qualified measurements, number of applications and maintaining of skills are essential. Thus, European Union has determined the criteria that each endoscopiest has to exercise at least 300 applications annually. Furthermore, since cecum intubation is considered as an evidence of completion of colonoscopy, taking pictures of the process is also determined as criteria.

**Colonography with Computerized Tomography (CCT)**
In CCT two and three dimensional visions are obtained by using many numbers of thin layered CT scans. For CCT, patients are applied intestinal cleaning just like in colonoscopy. This is done in order to avoid wrong positivity (36). Patients are not applied sedation and may return to work after process. Intravenous catheter may be applied during the process; with this smooth muscle relaxants like

glucagon may be applied. With the catheter located at rectum, air or carbon dioxide may be given. Visions are taken while the patient is holding his breath (36). Among the applications of CCT, there are giving of oral contrast, opening of intestines with carbon dioxide, using of multi-detector thin layered CS screenings, making two or three dimensional polyp search. CCT should be interpreted by specially trained personnel (54).

**Capsule Endoscopy**

In this test, there are two small cameras that are located on both two sides of a capsule. These cameras take visions while passing the colon. In this survey, intestine should be very well cleared. In case of a finding, biopsy or colonoscopy for polyp excision should be applied (55). In a prospective study, for the 6mm over polyps, sensitivity of this test is determined % 64, specificity is determined as % 84 (55).

## 6.10. Colorectal Cancer Epidemiology in Turkey and Current Situation in Colorectal Cancer Screening

According to data of cancer recording centers of Ministry of Health in twelve districts during 2007-2008, CRC is the third common cancer in women with ratio of % 7.8 and fourth in men with ratio of % 7.5 (2). Currently, containment ratio for colorectal screening is % 20-30 and most of the diagnoses in our country are at late stage. In order to reach successful results for colorectal screening, containment ratio should surpass the ratio of % 70.

**Table 6.1. Colorectal Cancer Screening Programs Global Examples**

| | | | |
|---|---|---|---|
| **Canada (M)** | Once in two years | 50-74 | % 18 (2008) |
| **Israel** | Annual | 50-74 | % 14 (2008) |
| **Japan** | Annual | > 40 years | % 17 (2002) |
| **Korea** | Annual | > 50 years | % 21 (2008) |
| **Australia** | Once in two years | in 55or 65 birt. | % 38 (2010) |
| **Croatia** | Once in two years | 50-74 | % 20 (2010) |
| **England** | Once in two years | 50-75 | % 54 (2007) |
| **Finland** | **Once in two years** | **60-69** | **% 71 (2009)** |
| **France** | Once in two years | 50-74 | % 34 (2011) |
| **Italy** | **Once in two years, FS** | **60-69** | **% 48 (2008)** |
| **Scotland** | **Once in two years** | **50-74** | **% 54 (2010)** |
| **Spain** | Once in two years | 50-69 | % 34 (2007) |
| **Czech Republic** | Once in two years or CS | > 55 | % 20 (2008) |
| **Germany** | **Annual** | **50-74** | **%19, KS % 3-4 (2009)** |
| **Latvia** | Annual | | % 8 (2010) |
| **Poland** | Periodic Colonoscopy | 50-66 | (2006-06), < % 2 |
| **US** | **Annual** | **51-75** | **% 80 (2010)** |

## 6.11. Colorectal Screening National Program in Our Country

**Colorectal Cancer Screening Method**
Considering the conditions and infrastructure of our country, the ideal method is fecal occult blood test (FBT) once in two years and colonoscopy once in 10 years. Fecal occult blood test should expose the existence of hemoglobin in fecal by using polyclonal and monoclonal antibodies and antigens used in tests should only be sensitive to human hemoglobin, should not get into reaction with animal sources hemoglobin that are taken by food and should not give wrong positive results.

**Target Population, Beginning and End Ages for Screening, Frequency of Screening**
Considering the country's conditions, target is the society based screening for all women and men beginning at the age of 50 and ending at the age of 70. Population to be screened will be annually invited and screening should be finalized for men and women at the age of 70 whose last two screening results are negative.

**Special Situations**
**In Fact Groups with High Risks and Very High Risks**
For individuals whose first degree relatives have colorectal cancer or adenomatosis polyp history, same procedure should be given start at the age of 40, for individuals with the history of colorectal cancer at an early age, screening should be given start 5 years prior to the diagnosis age of the relative. Screening and monitoring procedures will be determined by clinics for situations other than mentioned here.

**Place**
These works can be executed in accordance with Public Health Centers, Cancer Early Diagnosis, Screening and Training Centers (KETEM) and primary care doctors. These institutions should monthly inform Public Health Directorates to be communicated to Ministry of Health. Province Cancer Control Unit is responsible of coordination, recording and monitoring of the activities related with cancer in Public Health Directorates.

**Purchase of Materials**
Materials necessary for screening should be purchased via Public Health Directorates in competence with technical specifications prepared by Cancer Department of Ministry of Health and should be delivered to centers in return of official reports.

**Delivering of FBT**
General information on colorectal cancers is given to invited individuals by doctors, nurses and technicians working at Public Health Centers, Cancer Early Diagnosis, Screening and Training Centers (KETEM) and primary care offices. Then following a demonstrative training on how to use FBT kit, new kit is delivered with application brochure and information of individual is issued to Colorectal Cancer Screening Data Base

**Application of FBT**
FBT kit delivered by doctors, nurses and technicians working at Public Health Centers, Cancer Early Diagnosis, Screening and Training Centers (KETEM) and primary care offices, is applied by the individual at home and returned back to center.

**Evaluation of FBT Test**
Evaluation is undertaken by doctors, nurses and technicians working at Public Health Centers, Cancer Early Diagnosis, Screening and Training Centers (KETEM) and primary care offices and issued in data base. Individual is informed about the results and following period, necessary guidance is made.

**Methods to be Applied to Individuals with (-) FBT**
Normal result means there is no blood in test sample. Mostly (98 of 100) results are normal. Some of these are the people who repeat the test since previous results are uncertain. Normal results do not guarantee the individual does not have colorectal cancer or will not be; thus information on colorectal cancer is repeated and he is told he will be invited in two years for another colorectal cancer screening.

**Methods to be applied to Individuals with (+) FBT**

Abnormal result defines that there is blood in fecal, is not the diagnosis of cancer, but it means that colonoscopy should be applied. Reason of the abnormal result may be the bleeding of a polyp rather than colorectal cancer. It may also derive from another disease such as hemorrhoids. The individual should be steered to general or gastro surgery departments of state hospitals, research hospitals or university hospitals in order to determine whether there is a problem that requires treatment and to decide on more detailed examination (colonoscopy) of colon (intestine). Two of each 100 tests end up with abnormal results.

**Methods to be applied to Individuals with Uncertain FBT**

Uncertain result means there is not any finding of blood in the sample taken for FBT. This uncertain result does not mean you don't have cancer, it just means you have to repeat the test. If the result is uncertain, you are asked to repeat test utmost two times more. This is necessary because cancers and polyps do not continuously bleed and it is necessary to determine whether there is blood in the fecal. Four of each 100 tests end up with uncertain results. For many of those, repeating tests give normal results.

**State Hospitals, Education Hospitals, Universities**

State, education and university hospitals should be informed about the standard related with the issue, an environment of cooperation should be constituted for the education and informing activities, for patients who need further treatment, services should be definitely provided on planning of treatment and feedbacks.

**Promotion**

Campaigns should be organized in cooperation with mass media in order to inform public and create demand, spot movies should be shot with the help of popular artists of Turkey and these films should be exposed in appropriate times.

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# DIAGNOSIS AND TREATMENT CENTERS AFTER SCREENING

Within the project of Breast Cancer Screening nation-wide applied by Mobile Mammography, screening will be applied by digital mammography devices with recent technology and new diagnosis and treatment centers with latest technology are planned where determined suspicious cases will be steered at. Screening and post screening diagnosis are related processes. Steering of the patients for right centers for diagnosis, quality of service on diagnosis and treatment are important subjects to evaluate the quality of screening.

In a screening program in competence with quality criteria, planning of diagnosis and treatment are essential. Final training in screening programs is to increase the living quality and life expectancy of the patient and to decrease the ratio of mortality with the help of early diagnosis. How and duration time for the diagnosis and treatment after screening are also defined by European Quality Standards. Here are some of the determined standards on diagnosis and treatment:

**For Breast Cancers;**

- Breast cancer diagnosis ratio by needle biopsy (IIAB, vacuum or core biopsy): > % 90
- Ratio of insufficient results in needle biopsy: < % 20
- Need for reoperation after incomplete excision: % 10
- Duration to decide on operation and taking into operation: 15 business days

**For Cervical Cancers;**

Since the incidence of cervical cancers differs for countries, studies so far are unable to determine definite quality measurements like in breast cancer screenings. But, in national screening programs, below mentioned performance criteria are evaluated annually.

- Containment of screening should be at least % 70
- For lesions CIN II and above, HPV test sensitivity should be at least % 90 of reference test (HC II) and specification should be % 98.
- Ratio of cancer cases determined by screening to the whole cancer cases
- Ratio of women invited for retesting
- Ratio of steering to colposcopy
- Ratio of attending to colposcopy
- Ratio of women whose lesions are confirmed histological with colposcopy to all women who are applied colposcopy
- Ratio of cancers among abnormal results

**For Colorectal Cancers;**

- Sedation
- Monitoring of patience after sedation
- Antibiotic Prophylaxis
- Following up anticoagulant
- Endoscopic evaluation of colorectal abnormalities
- Endoscopic removal of lesions (both high and low risk);
- Marking of lesions with high risk;
- Management of high risk lesions and equipment.

**Endoscopic reporting and minimum requirements**

- Determining of procedure in which lesion is obtained
- Information of patient/requester
- Type of endoscopy (FS or KS)
- Crew (endoscopiest and assisting personnel)
- Purpose of the procedure
- Primary screening
- First screening and following screening

- Primary screening procedure interval (if any)
- Endoscopic examination interval mentioned above

**Evaluation of Abnormal Findings**
- Post positive screening test
- Post positive symptomatic test

**For Reevaluation of abnormal findings**
- Surveillance
- Previous endoscopic procedure and procedure type interval
- Preparation, insufflations, sedation
- Intestine cleaning diet
- Insufflation gas (air or CO2)
- Type of material used in anesthesia
- Post cecum visioning
- Intubation period (time at the beginning of cecum, post cecum visioning time) reasons of incomplete inspection should be determined.

As it can be seen from these characteristics, diagnosis and treatment are inseparable; an efficient screening program can only be applied if these two issues are properly managed.
Within the scope of mobile mammography project, it is planned to build Post Screening Diagnosis and Treatment Centers in 23 districts. In these centers;

1- General Surgeon
2- Radiology specialist
3- Gynecologist
4- Pathology specialist
5- Medical oncologist
6- Radiation oncologist
7- X-ray technician
8- Physical therapist should be employed. These personnel should be educated on organ protective diagnosis and treatment methods. Thus, cooperation will be built with profession organizations.

Applications that should be exercised in centers and necessary equipment

- Needle biopsies
  1- Through – cut thick needle biopsy
  2- Thin needle biopsy
  3- Stereaotaxic (vacuum) biopsy
  4- Marking with wire; in company with US and mammography
- Digital tomosynthesis mammography device
- Breast MR
- Breast ultrasonography
- Colonoscopy
- Colposcopy

Quality monitoring of diagnosis and treatment centers should be executed by Turkey Public Hospitals Institution (TKHK) and Head of Department of Cancer. As a member of IARC, each year we increasingly use EU criteria for 3 cancers. For 2014-2017 period, planned districts for building Diagnosis and Treatment Centers and patient loads for breast cancers are shown in Figure 1. This planning is made within the framework of Turkey Oncology Services Restructuring Program 2010-2023 prepared by Treatment Services Directorate General.


**Figure. 7. 1. Our 2023 aim is to establish at least 81 Diagnosis and Treatment Centre in 81 province.**

## 8.1. Treatment Services

Studies have been made for the practice of oncology treatments by establishing Comprehensive Oncology Centers, Treatment and Diagnosis Centers of Oncology and Oncology Service Units in hospitals of Public Hospitals Administration of Turkey, private hospitals and university hospitals. Treatment plans have been made within the scope of Private Health Service Plans for 2023 by Public Hospital Administration of Turkey and in the making process of these plans cancer statistics are shared and everlasting cooperation concerning other technical and scientific matters is ensured between the head of department and regional planning. Epidemiological data, geographic conditions and means of transportation have also been evaluated as well as cancer statistics.

## 8.2. Comprehensive Oncology Center

These are the advanced centers which are equipped with advance knowledge and set-up in the field of oncology may contribute to the creation and implementation of National Cancer Policy and are expected to train experienced personnel for oncology centers.  8 hospitals of Public Hospital Administration of Turkey have Comprehensive Oncology Centers with minimum benchmarks and 2 more hospitals will have this facility within 2014. Comprehensive Oncology Centers have been planned to be established in 10 top health service areas till 2023

## 8.3. Treatment and Diagnosis Center of Oncology

25 hospitals of Public Hospital Administration of Turkey have Treatment and Diagnosis Center of Oncology that can play an active role in providing standard oncology services, with minimum benchmarks and 9 more hospitals will have this facility within 2014. Treatments and Diagnosis Centers of Oncology are planned to be established in 29 health service areas by 2023.

## 8.4. Oncology Service Units (OSU)

These are the units which can practice treatments especially chemotherapy and serve supportive care planned by upper centers in rural regions under the supervision of a doctor trained for chemotherapy practice without an expertise on oncology. At the first stage Oncology Service Units are planned to be established gradually in 50 provincial centers between 2011-2015 with the planning of Comprehensive Oncology Centers and Treatment and Diagnosis Centers of Oncology. At the second stage they are planned to be established in 61 sub-provinces between 2011-2015 considering the situation in the province, the distance between province and sub-province and patient load.

33 hospitals of Public Hospital Administration of Turkey have Radiotherapy Centers. 5 of these centers have Cyberknife, 6 of them have Tomotherapy and all of them have Linac.

85 hospitals of Public Hospital Administration of Turkey have Nuclear Medicine Centers and 27 of these centers have Pet-CT devices.

## 8.5. Proton Therapy

Half of the cancer patients are treated with radiotherapy during a certain period of their treatment. Proton therapy is completely new for Turkey and used by a limited number of centers. Its control and orientation is highly expensive. 24-36 months are required for its setup and it is still in the development process. Despite those disadvantages, particle (proton and carbon) therapy is expected to replace the radiotherapy supposing that it can keep up with the technological developments of photon. Proton therapy diminishes the risk of reoccurrence of the cancer and side effects after radiotherapy and improves the morbidity of the treatment. Plans to establish 2 proton therapy centers in Ankara and Istanbul are in progress.

## 9.1. Palliative Care

Latin word "Palliate" means protective and comprehensive. In English terminology "Palliative" is used for alleviating, soothing and temporary relief. Palliative care is a system that improves the life quality of people with progressive, incurable and fatal diseases.

It is an approach to improve the life quality of patients facing problems due to life threatening diseases and their relatives by preventing and removing all physical, psychosocial, mental problems and especially pain with early diagnosis and effective evaluations. It is a multidisciplinary approach focusing on the life quality of patients and their family and the will to deal with the problems.

## 9.2. The Current Situation in the World

According to the definition of World Health Organization (WHO) palliative care aims to remove the physical, psychosocial and mental symptoms of patients and also support patients' family as well as care takers and relive their pain. Life and death are considered as the parts of palliative care. Death is neither delayed nor hastened. For palliative care life quality is more important than the life span. As the end-of-life draws closer, comforting precautions intensifies for the patientand his family and after patient has passed away, palliative care focuses on supporting the family in grief.

First of the palliative care unit was established in 1842. First of modern hospice (last phase patient care center) service is initiated by the nurse Cicely Saunders in 1967 and the number of hospices has increased since. WHO defined the palliative care for the first time in 2002 and it published the Guidelines for Palliative Care (1,2).

Various units such as home care services and institutions providing health services in bed have been established since the foundation of first palliative care service in 1983 in Germany. Institutions offering palliative care services aim to provide high quality service for patients in need of palliative care. According to the statistics of 2005, there were 111 hospice services, 131 institutions providing hospice services in bed, 116 palliative care units in hospitals and 40 home care services operating actively. Despite these numbers, it seems that services do not meet the demands. Palliative care is lectured as a separate course in many medical faculties, nursing schools and other related vocational schools. Researches in this field are limited with pain management in cancer and a few incidents.

Palliative care can be conducted in hospices, hospitals and home. There are different approaches for palliative care around the world. These can be classified as follows;

1. Palliative care for bedridden patients: It is important to provide more efficient and suitable service as palliative care suggests. Patients don't have go through loads of examination and symptoms can be controlled in a more appropriate way. This system reduces the cost of hospital and the resource usage.
    - Acute palliative care services
    - Subacute and chronic palliative care centers
2. Home care: It aims to provide the same services provided by hospital at the patients' home and environment. Patients can get palliative care 7/24. It is more suitable for the patients in need of specialized care such as parenteral administration for drugs and physical therapy.
3. Hospice: Hospices are hospitals with home-like atmosphere, where the symptoms of the patients that are no longer responding to the treatment or are on the stage of dying are being controlled. The goal is to enable the patients to live their remaining days in a comfortable and honorable way and to die humanely.

4. Day Care: Day Care Units are club-like environments that aim to prevent the isolation of the patients and keep their symptoms in check.
5. Palliative Care Ambulatory Care Services: These are services where supportive care is provided daily.
6. Palliative Care Consultation Service: Mobile Palliative Care Units that provide services in hospital units or in the vicinity of the hospital when the need arises.

As mentioned above palliative care starts with the diagnosis and continues after death. While the palliative care is essentially all the supportive care services provided in this process, to achieve unity in the use of academic language, in time palliative care was classified as follows:

**Supportive Care:** Supportive care provided to patient and patient relatives in all stages of illness.

**Palliative Care:** Services provided to incurable patients and patient relatives for their comfort.

**Last Stage Care:** Services provided when the patient is close to dying.

From the start of 1990's palliative care services have improved rapidly in advanced countries such as United Kingdom, Canada and Scandinavian countries. Until the year of 2009 more than 4200 doctors have received career education in palliative care. In the year of 2010, palliative care services were established in 220 hospitals and 170 hospice centers were built. Number of care centers all over the world is shown in Table 1.

**Table.9.1. State of Palliative Care around the World**

| Countries | The Number of Clinics |
|---|---|
| USA+Canada | 3600 |
| England | 933 |
| 36 European Countries | 1200 |
| Other countries | 477 |
| **Total 84 Countries** | 6560 |

## 9.3 Situation in Turkey and the Pallia-Turk Project

Palliative Care is an obligatory necessity for patients with cancer or other chronic mortal diseases. As a result of Turkish Family structure, the need for palliative care services hasn't become a current issue for a long time. However, in parallel with the changing demographics of the country the need for such services continue to rise. There are currently only a small number of palliative care centers in the country.

The main reasons for the absence of Palliative Care Services are lack of adequate awareness among patients and doctors, need for such services not being necessity as a result of traditionally big families and patriarchal family structure and lack of human resources.

Eventually, current inadequacies in the treatments, which are essentially human rights, should be eliminated as soon as possible. These services that are to be provided all over the country should constitute an example for the countries in the region.

The Pallia-Turk Project was launched in the year of 2010 and within its scope, The Public Hospitals Administration of Turkey works together with Public Health Institution of Turkey and Directorate General for Health Services to develop the optimal model of palliative care for our country. The Directive draft related to the application of this model was created with the opinions of relative Ministries, Universities and Non-Governmental Organizations. In the following term pilot studies in

respect of palliative care services were started. Thus our country became one of the few countries who rose to Group III B in WHO classification in 2011.

While the most important aspect of palliative care services is pain management, many doctors and nurses are unfortunately inadequate in terms of training. As a result of this there is a constant fear against the usage of morphine (opiophobia) among medical staff. However with correct selection of patient and with fair use, morphine is an analgesic that can be used with ease and trust.

Furthermore accessibility to the morphine, which has a important place in palliative care services, proves difficult and current morphine diversity is also at low levels. Especially the lack of knowledge in opioid treatment and fear of side effects and addiction when using opioid, medical use of analgesics such as morphine being restricted by law causes inadequacy in opioid treatment. However, our country is where the raw material of medical morphine used around the world is manufactured in large amounts. Necessary protocols to start the local manufacture of chemotherapeutic and opioid are completed and production phase has begun.(Table 2

**Table 9.2 oral morphine intended to be locally manufactured in Turkey**

| Medication | Quantity | Özelliği |
|---|---|---|
| Morphine MIR 15 mg | 600.000 | Oral, Fast Release |
| Morphine MIR 30 mg | 400.000 | Oral, Fast Release |
| Morphine MCR 10 mg | 500.000 | Oral, Slow Release |
| Morphine MCR 30 mg | 400.000 | Oral, Slow Release |
| Morphine MCR 100 mg | 300.000 | Oral, Slow Release |
| **TOTAL** | **2.200.000** | |

The number of currently available palliative care services is shown in Table 9.3.

**Table.9.3. Current Palliative Care Centers in Turkey**

| Year | The Number of Palliative Care Services | Total Bed Count |
|---|---|---|
| **2014** | 15 | 179 |
| **2015** | 97 | 1112 |

Health Services constitute the first step of The Pallia-Turk Project, which we intend to use in our country. We plan to carry out most of our palliative needs with our family doctors and medical teams without the need for hospital care centers. This model, which we come to define as community based palliative care model was evaluated by a number of both national and international institutes and was accepted as an example model across the globe. The most daunting task developed in palliative care models are the integration of these services to first step of health services. In this context, final situation of health services in homes since 2010 is shown here in Table 9.4.

"Medical Home" was established in our country in 2010 and pursuant to this training models for palliative and home care were developed. Palliative Care Trainings began and World Bank Project, aimed at these trainings, was started.

In the forthcoming years training and the integration of Family Doctors will be completed. Apart from first step applications, planning of the hospital centers which patients can prefer to use when the need arises until the year of 2023 have been completed. After the directive comes into force, planned palliative care centers will start to provide services in all of the cities one after another.

Pallia-Turk Project studies will be completed across the country in the upcoming years. Palliative Care Services are already provided to patients in need in different clinics. Our aim is to infuse this approach, which cares for both the length and the quality of life to medical staff and society and raise the number of institutions that provide palliative care services.

**Table 9.4 Medical Home Statistics Since 2010**

| Years | 2010 | 2011 | 2012 | 2013 | 2014 | 2015* |
|---|---|---|---|---|---|---|
| **Total Patient** | 16651 | 124085 | 244961 | 380814 | 510352 | 596024 |
| **Active Recorded Patient** | 16651 | 80388 | 139214 | 186666 | 218353 | 248694 |
| **Unit Count** | 407 | 642 | 715 | 817 | 915 | 946 |
| **Tool Count** | 78 | 793 | 956 | 1128 | 1111 | 1130 |
| **Staff Count** | 478 | 3512 | 4143 | 4248 | 4605 | 4666 |

* Provided data is by at the end of June 2015.

# INTERNATIONAL ACTIVITY AND RELATIONS

## 10.1 IARC (International Agency for Research on Cancer)

International Agency for Research on Cancer was founded with the initiative of France as an extension of World Health Organization as it was proposed on 18th World Health Summit in May 1965. Founding members of IARC are: Germany, France, Italy, USA and England. Its administration building is located in France, Lyon. Today the number of member states has raised 24 with the accession of Qatar and Brazil (Australia, Austria, Belgium, Canada, Denmark, Finland, India, Ireland, Norway, Holland, Korea, Russia, Spain, Sweden, Switzerland and Turkey).

Participation in meetings of IARC which is the biggest and most significant agency conducting research on cancer and maintaining the membership are important for tracking of current scientific data. Its most significant duties are preparing monographs and updating lists regarding carcinogenic materials besides a number of worldwide researches. Moreover, it carries out the most significant genetics and nutrition surveys (EPIC) across the globe.

Prof. Dr. Mutlu Hayran from Hacettepe University is in the scientific board while chief of cancer department Assoc. Prof. Dr Murat Gultekin is in the board of directors.

The book of Global Cancer Control which is due to be published this year by IARC includes the program of Cancer Control in Turkey.

Izmir Center of Cancer Registry has been selected as regional training center by WHO-IARC and foreign experts from nearby countries have started receiving cancer registry training.

IARC presents opinions to Head of Cancer Department on every issue discussed in the scope of public interest. Most recently Joint Symposium on Health Effects of Electromagnetic Fields was organized on November 2013. It has been planned that our head of department and IARC determining quality standards of cancer screening throughout Europe are going to carry out important studies specific to cancer screening in particular, Environment-Cancer, Nutrition-Cancer in the following years.

## 10.2 European Union Science Commission

Cancer becoming gradually widespread in the world has put European Union Science Commissions in action and it has been specified as a priority target to deal with in the field of health. Joint strategies have been specified by the Cancer Control Scientific Board of European Union constituted for this purpose and of which our head of department is a member on July 2014.

It is possible to summarize the strategies which take place in the commission report published on 3 July 2014 and is desired to be carried out by 2013:

1. It has been stated in the report that there are two important steps in the fight against cancer and these are ‘’Preview’’ and ‘Cancer screenings – Early diagnosis’’. Moreover it has been stated that causes like usage of tobacco products in particular, obesity, low consumption of greengroceries, alcohol consumption and physical inactivity are preventable factors giving rise to occurring of cancer and fighting against these factors may prevent occurring of cancer at the rate of 30%.
2. In the stage of early diagnosis screenings of especially cervical, colorectal and breast cancers are important. It has been stated that in case of reaching 100% coverage rate in the screenings of cervical cancer there will be a decrease over 94% in the expected life lost due to this kind of cancer.
3. It has been stated that the number of new diagnosis of cancer which are common in member states will reduce by half if screenings of cancer (cervical, breast and colorectal) become widespread in the

member states and reach the expected rates. For this reason, it has been suggested that 100% coverage rate of breast, colorectal and cervical cancer screenings should be reached and member states should engage in activities including running big media campaigns.

4. It is suggested that precautions to be taken towards infectious factors like HPV causing cancer should be evaluated in terms of effective fight against cancer.
5. The importance of palliative care services aiming to improve the quality of life for those diagnosed with incurable terminal cancer has been emphasized. It has been stated that member states are on different stages concerning palliative care services they share their own experiences with each other in this respect and thus a joint international standard can be achieved.
6. There is a need carrying out studies in the field of cancer to be enhanced and especially international cooperation fields concerning this issue to be formed.
7. Cancer registry in member states should be improved since the fact that member states constitute situation reports in the fight against cancer plays an important part both in determining countries' policies and making international remarks.

4th European Code Against Cancer was published by International Agency for Research on Cancer (IARC) on 14 October 2014. It has been emphasized in this code which has been prepared completely based on scientific evidences that main points of fight against cancer are preventing cancer and healthy life strategies as a result of 2 years works of scientists and experts relating to the issue in European Union member states. Detailed scientific reports which have been formed with synthesis of all researches concerning each cancer code will be published by IARC.

12 articles of 4th European Code Against Cancer are as follows:

1. Do not use any tobacco product, do not smoke.
2. Do not be exposed to passive smoking at your home or workplace. Ensure that your home and workplace are 'nonsmoking' areas.
3. Be active physically, restrict your time you spend by sitting.
4. Make efforts in order to reach your healthy bodyweight.
5. Eat healthy foods;
   - Consume sufficient amount of grain, legume, fruits and vegetables.
   - Avoid high-calorie foods and sugared drinks.
6. Consume no alcohol in order to prevent cancer and if you consume alcohol restrict the amount of it.
7. Do not be exposed to excessive sunlight and protect especially your children from it. Use sun screening products and stay away from solariums.
8. Protect yourselves from factor which may cause cancer by reading safety and health instructions.
9. Learn whether the level of radon at your house is high or not and take necessary precautions if it is high.
10. for women;
    - Breastfeed if you can since it reduces the risk of cancer.
    - Restrict the use of Hormone Replacement Therapy (HRT) since it increases the risk of certain types of cancer.
11. Make your children involve in the Hepatitis B and HPV vaccine programs.
12. Participate in the society-based screening programs on cervical, colorectal and breast cancer.

## 10.3 BSC (The Black Sea Countries Coalition on Breast and Cervical Cancer Prevention)

The Black Sea Countries Coalition on Breast and Cervical Cancer Prevention was founded in 2011 under the leadership of honorable first lady of Georgia Sandra Roelofs. Presidency of the coalition which involves Ministry of Health authorities of Armenia, Azerbaijan, Hungary, Georgia, Moldova, Romania, Turkey and Ukraine, regional leaders of United Nations Population Fund and the head of European Cervical Cancer Association (ECCA) has been conducted by T.R. Ministry of Health until 2016.

## 10.4 UICC (Union for International Cancer Control)

Union for International Cancer Control is a non-governmental organization founded in Geneva in 1933 with the aim of being active in the fight against cancer which is gradually increasing worldwide.

Over 760 cancer association from estimated 150 countries worldwide is registered to UICC. Apart from that it works closely with other health institutes (World Health Organization – WHO, The International Agency for Research on Cancer – IARC, Program of Action for Cancer Treatment – PACT).

On the World Cancer Day, Union for International Cancer Control (UICC) organizes awareness activities on a global level in cooperation with related institutions and organizations worldwide and publishes through its' website. Turkey has an important privilege in UICC. Presidency of this union which is formed by over 200 non-governmental organizations working on cancer is being carried out Prof. Dr. Tezer Kutluk by the year of 2015. Moreover, our Department of Cancer is the only official government department which is registered to this union.

## 10.5 USA Cancer Institute and World Cancer Leaders' Summit

NCI is an institute connected to National Institute of Health (NIH) which is one of eleven agencies of USA Department of Human and Health Services. Researches of causes of cancer, prevention, diagnosis and therapy are being carried out by this institute and information and data collected from these studies are provided to community. It also leads researches of new medications which are being developed for cancer treatment.

NCI is conducting certain parts of these researches and supports the rest of them (cancer researches conducted in the other areas of USA) by financing.

NIH is declared as an independent research institute by USA Senate on 6 August 1937. NCI is founded on 1 July 1944 and has become an important institute in the fight against cancer whose responsibilities are gradually expanding with the support of laws by government.

Cancer leaders of developed countries such as Australia, Canada, China, France, Germany, Hong Kong, Italy, Japan, Mexico, Netherlands, England, USA and Turkey participate to "Cancer Summit of Developed Countries" organized by NCI.

At these summits, it is provided that world leading state authorities on cancer can meet and produce close relationships. Important meetings are held in terms of creating a common language on the field of cancer, initiating international joint works and providing a transnational helping environment by mutually discussing the problems in detail.

## 10.6 IPRI (International Prevention Research Institute)

IPRI is an independent institute which conducts international prevention researches and is in service since 2009. It conducts researches on important health issues and publishes international guides with the information gathered. Researches in progress include diabetes, cancer and disease scanning. For every subject, a compilation is published by evaluating conducted researches together.

Addition to scientific researches, IPRI organizes various meetings such as International Cancer Institute director meetings.

IPRI is preparing to serve as an education center as part of Membership of Global Events of Health Institutes and to offer education opportunity to all its' members.

In the "World Cancer Report, 2013", Turkey took part with its' cancer control program and furthermore,

was considered amongst the best programs in World Cancer Leaders' Summit with its' cancer control program.

## 10.7 ANCCA (Asian National Cancer Center Alliance)

ANNCA is founded in 2002 and it organizes closed meetings every 2 years to which international cancer directors participate. Cancer Institute/Association Directors of member states participates to the meetings organized by the ANCCA platform which our country also is a member.

## 10.8 APOCP (Asian PaciŞc Organization of Cancer Prevention)

Asian Pacific Organization of Cancer Prevention is an independent institution which is founded in 2002 with the aim of developing cancer prevention activities amongst Asian Pacific States and conducting international joint studies on other cancer issues. Providing opportunities to expert researchers for conducting international studies and sharing the results of these studies on a common platform are amongst the main objectives of this organization. Editorship of international journal published by APOCP is carried out by our department.

## 10.9 International Participation Annual Meeting of World Health Organization Project of Electromagnetic Fields

In May 1996, "International Electromagnetic Fields Project" is established upon the requests of Member States. In the project, governments of member states and international independent research agencies (ICNIRP, ITU, IEC) are carrying out studies together.

More than 50 country take part in the project and first of the annual meetings is held last year. First official participation to meeting as Ministry of Health is carried out in 2013 and on the dates of 4 and 8 June 2013, to the second annual meeting of project held by World Health Organization, participation is ensured as Turkish representatives of project.

Participation to these annual meetings is important in terms of monitoring the international scientific data, standards and applications and conducting joint studies.

## 10.10 ESCO (European Society of Gynecologic Oncology)

ESGO (European Society of Gynecologic Oncology) was founded in 1983 as a small group consisting of academicians who study on women's cancers. Today it has reached the level of an international organization which has the mission of unifying everyone studying on gynecological oncology; do not seek profit by becoming a major non-governmental organization and expanding over the years with its members exceeding 1400 from more than 40 countries. ESCO holds meetings in various regions of the world to share its works relating to women's cancers every two years and related representatives of the countries participate in the meetings.

It is an association carrying out important studies in the field of Gynecologic Oncology across the Europe. Assoc. Prof. Dr. Murat GULTEKIN who will perform the task of vice presidency for two years as of the date of 2016 is founding president of an association called ENYGO (European Network of Young Gynecological Oncologists) which is active within the body of this association and puts gynecological oncologists together. Out honored head of department is the second Turkish citizen to be in the board of directors of the respective association. ENYGO continues carrying out its studies to improve the education quality of young oncologists and enables generations which will take the lead in the following

years to put their signatures under joint works by introducing them to each other. Contributions are made for the performing of reciprocal studies within the platform of the association.
It is being planned that 3rd print of the Textbook of Gynecological Oncology which was firstly edited by our country in 2009 and have a broad repercussion in Europe will be done for the year of 2015 under the leadership of our country. The proposal for founding a platform named ENPIGO

(European Network of Prevention in Gynecological Cancers) has been approved by our head of department in order to increase the interest of citizens towards cancer screening programs, emphasize that cancer is a preventable disease, develop algorithm for constituting a basis in this issue and carry out activities concerning awareness and education. Furthermore, it has been decided that our department head will be in charge of presidency of ENPIGO along with world-famous people of this issue for 2 years.

# NATIONAL CANCER INSTITUTE WITHIN THE BODY OF DIRECTORATE OF TURKEY HEALTH INSTITUTES AND WORLD SAMPLES COMPARISON

DIRECTORATE OF TURKEY HEALTH INSTITUTES (TUSEB) was established for completion of deficiencies in researches which are present in health field in our country. In order to render service to the country and humankind within field of health sciences and technologies, it was established to increase and perpetuate competitive power of Turkey, to meet needs for advanced technology, know-how and innovation of our country by taking development plan targets and priorities determined by The Supreme Council For Science and Technology into consideration, to provide production of new products and development of pre-existing ones, to provide scientific media for researchers, to make, have it made, coordinate and encourage scientific researches by cooperating with public and private law legal entities, to contribute to researches, to pioneer in development of health, science and technology culture and ecosystems, to run accreditation activities in health services on behalf of Ministry of Health and to regulate principles concerning organization and duties of Turkey Health Sciences High Technology İnstitute.

Directorate of Turkey Health Institutes is harmonization of a scientific structure which will study in direction of policies of the country with a management with high level of determination. It has been expected that the synergy which will arise through placement of scientific approach, production and needs of country as trivet will extract our country from "Middle Income Trap". Countries and/or regions which reached to level of middle income in terms of IPC to stuck in an income band, in other words cannot be able to pass to "High Income" level is defined as "Middle Income Trap". According to the classification in World Development Report of the World Bank in 2012, economies whose income per capita is between 1.006 and 12.275 dollars are classified as Middle-Income. In Turkey income per capita which was 10.444 dollars at the end of 2008 managed to increase only 338 dollars within 5 years. It means that there was only a 3.2%-increase within 5 years. Low growth rates will not allow Turkey to extract from the middle income trap. This trap can be extracted only with a new development strategy which had features including reforms which follow new trends worldwide and enable products with high value-added tax that is our comparative advantage and encouragement systems. With institutes which will enable local production, studies and researches, empowerment of claim of leadership in health field in the World will be procured.

The institute may be a sample model which will work with Ministry of Health in cooperation, bring priorities of public into forefront and combining scientist, patient and industry and pharmaceutical industry. Similarly, it enables itself to work with many hospitals, laboratories and research centers target-driven and practically with affiliated systems.

## Why is Cancer Institute?

Nowadays, policies concerning battle with cancer and non-communicable diseases have become an important title in international qualified studies and national health policies. Increase in incidence of non-communicable diseases, as cancer being on top and cause of death demonstrates that it will remain to be an important topic in health policies and priorities of societies and governments in the future decade. Thusly, with a meeting in the presence of United Nations in 2011, it was concluded that all world countries will prepare and apply national activity plans and strategy documents in order to battle against non-communicable diseases.

Turkey is among limited countries which gave start to national battle programs against cancer, tobacco and obesity since 2007 much earlier than many other countries worldwide. Recently, successions obtained with control programs against tobacco and cancer are remembered with respect in international scientific literature. With Healthcare Transformation Program given start in 2002, many successions have been succeeded in health field in our country. Many preventable deaths have been prevented with maternal and infant health and battle against communicable diseases, mean survival has increased from 70 up to 75.

Due to priorities and changing life styles in our country, health policies are focused on non-communicable diseases, as it is all over the world. According to cancer statistics published in February 2014 by World Health Organization, number of people died of cancer between 2000 and 2007 increased to 7.9 million people by increasing 32% in 2007. Again according to the same report, 13% of all deaths all over the world resulted from cancer in 2007. Deaths from cancer occur most commonly in developing countries. In the report published by World Health Organization, 70% of 7.9 million deaths in 2007 were suspected to occur in developing countries in which 80% of world population lives.

According to forecasts published in 2012 according to data of World Health Organization, total of 14.1 million new cancer cases appeared in the World, in case of maintenance of this increase rate in cancer, it was reported that 19.3 million new cancer cases will occur in 2026 due to increase in world population and aging in population. This obvious increase in number of patients that live with cancer or just diagnosed with it will be inevitably accompanied by increased expenditures for treatment and care.

In our country, deaths from cancer are still the second most common in both males and females. However, when increase of deaths from cancer from 12% in 2002 up to 20% in 2013 is taken into consideration, it is clear that our country will be placed on the top in the future like other developed world countries. In accordance with the most recent data, 160 thousand people are diagnosed with cancer annually in our country. If we fail in precautions we take, this amount may reach up to 400 thousands in 2023. There is no doubt about that when effects of cancer on socio-economic status and labor force are considered, how much crucial necessity for battling effectively with this disease for our future is obviously clear.

Turkey is located within the six countries which spend in highest amounts for cancer with 3 billion euro among EU countries. Countries which spend more than Turkey are Germany, France, Italy, England and Spain, respectively. Unless necessary precautions are taken in long term, cancer has a potential to be a serious risk for health system in Turkey. Population of Turkey is increasing day by day. Percentage of age group of 45+ which was 25% of total population in Turkey in 2007 is being expected to increase to 30% in 2020 and to 35% in 2030. When it is considered that accessibility to healthcare and individual and environment factors are increasing day by day, expenditures for cancer treatment with is approximately 2.5 billion US dollars nominally are expected to be at least 3-fold increased in 2030.

Health policies applied in Turkey and level and quality of presentation of expenditures which result from these policies not only increase survival but also decrease negative exteriority and influence economic growth positively. In addition to this, it influences negatively in issues such as the disease cancer to present dissemination, the disease to be realized at advanced stages, insufficiency of public policies and services concerning prevention, results of health policies, loss of life and decrease in quality life years. Additionally, the disease to require significant expenditure for medications and treatment causes it to become a severe risk factor which may influence financial structure of health system negatively in long term. In order to minimalize these negativities and risks in a short period of time via effective battle against cancer, in Turkey, like in many developed countries, an effective institutional structure which may conduct this battle is need.

Based upon all these reasons, the new institute for effective battle against cancer to have a distinct legal entity and scientific, administrative and financial autonomy and establishment of the institute in accordance with private law provisions apart from provisions of law of establishment has been suggested. Thus, opportunities of employment of more qualified staff about cancer and utilizing of its incomes more effectively will be procured for the institute as a result of reduction of bureaucratic procedures, more rapid utilization of national and international opportunities, the institute to have its own sources of income apart from central administration budget incomes, conduction of projects more effectively in cooperation with other public and private institutes and flexible employment opportunities. In other words, the suggested institute will possess all required opportunities in order to battle against cancer more effectively.

## World Samples

**United States of America National Cancer Institute (NCI)**
USA National Cancer Institute was established in 1937 with published law, and its duties and authorities were extended in 1971 with law. Annual budget of NIH is 30 billion dollars and 5 million dollars of this is allocated for NCI. NIH and subsidiaries serve directly under the government, its major sources of income are comprised of funds appropriated by the government. Approximately 80-90% of its budget support 300.000 researchers and 2500 universities via competitive grant schemes. Legally it is forbidden for them to receive bequest. Foreign institutes and international organizations (including public or private non-profit or profit institutes) can apply for the large part of their grants reserved for researches.
Management audit of National Cancer Institute is comprised of President's Cancer Panel, Office of the Director and National Cancer Advisory Board and is responsible for

- Supporting and coordination of researches conducted by universities, hospitals, research agencies and business world with research projects and partnership agreements,
- Conduction of researches in clinics and laboratories in the institute,
- Supporting of education regarding basic sciences and clinical discipline,
- Supporting of research projects regarding cancer control, supporting of national networks among cancer control centers,
- Cooperation with other organizations and local and foreign institutes for researches and education,
- Supporting and coordination of program-based researches concerning industry,
- Collection and distribution of information concerning cancer, funding for establishment of required clinics, laboratories and other units.

In USA sample, American National Cancer Institute supports research-based institutes for scientific perfection and integration of different research programs. This institute approves cancer centers in different groups as being Clinical Cancer Center, Cancer Center, Full-Service Cancer Center. In USA, patients and their relatives pay attention to whether centers they admit are approved by USA National Cancer Institute.

**National Cancer Institute of Canada**
National Cancer Institute was established in order to do researches in 1947 with attempts of Ministry of Health and Cancer Society. In 1988, it has become its current status through determination of its goals. Later on, Terry Fox Foundation has started to participate in management of the institute. In 2000, Canada National Health Research İnstitutes containing 13 distinct institutes along with the Cancer were established in accordance with law. Annual income in 2009-2010 was over 1 billion dollars and serve directly under the government.

**French National Cancer Institute (INCa)**
French National Cancer İnstitute was established in 9 August 2004 on the purpose of maintenance of a coordinated national policy in battle against cancer, in accordance with law of public health, within the scope of Cancer Plan, as dependent to Ministry of Researches and Health. This institute is an agency which does scientific and medical studies about cancer. It works with an interdisciplinary principle in order to integrate and stimulate shareholders and sources within projects. Additionally, it aims to relay information which is adapted for public, patients and professionals. The institute combines its partners in battle against cancer in France under tutelage of Ministries of Researches and Health. Financial resources of the institute are comprised of sources and circulating capital allocated by Ministry of Health and Ministry of Researches and sources allocated by social insurance system.

**Korean Cancer Institute**
Korean National Cancer Center (NCC) which was established as a state institute in 2001 aims to support research, patient care and national against cancer programs and to reduce incidence and mortality rates of cancer in Korea via training of cancer specialists. NCC is composed of three main components: Research İnstitute, Subsidiary Hospital and National Cancer Center Research Institute (NCCRI). RI conducts its own researches and supports research activities of Korean Cancer Society via programs focused on researches within its own body or external transformational researches. There are specialized

centers for 6 organs within the hospital. Each of these centers in which there are medical, surgical and radiation oncologists and oncology nurses renders high-quality cancer treatment services for patients. NCCRI play a part as a think tank and supports the government for organization, conduction and supporting of against cancer programs.

**Japanese National Cancer Center (NCC)**
National Cancer Center (NCC) was established in Tokyo in 1962 for development of national policies against cancer. Along with spread and development of activities of this center, National Cancer Center Hospital was established in Kashiwa. In 1994, National Cancer Center Research Institute was established as researching branch of the hospital. In 2005, Clinical Research Center was established by integration of parts of the hospital and research institute. In addition to National Cancer Hospital, building up of a hospital building was started. In general, apart from establishment of a policy and strategy formulation, it conducts diagnosis, screening and treatment of cancer and research activities. In the Cancer Information System which was established based upon recommendation of Ministry of Health, it has a role as central institute.

**Hungarian National Institute of Oncology**
Ministry of Health established National Institute of Oncology with a regulation in 1952, thus, has conducted all activities against cancer in Hungary. Hungarian National Institute of Oncology functions as center for epidemiology, methodology, treatment, research and education. While administration of the institute was conducted by a manager bond to Ministry of Health till 1987, later on, it has been referred to a administrative board. It has led up to researches having relative freedom in administrative, financial and intellectual aspects. Institute was reconstituted with three centers as being Clinical Oncology Center, Pathology Center and Research Center which were established as to concern field of activity of the Institute in 1992. The most significant feature of Institute of Oncology is the ability of providing complex clinical onco-therapeutic treatments for the patients (surgery, chemotherapy and radiotherapy). Along with personal conditions, the most developed equipments for tumor diagnosis (CT, MRI, imaging, laboratory, pathology) serves their abilities for high-quality diagnosis and follow-up with the help of an expert staff which is well-informed and extremely well-trained about imaging, laboratory and pathological diagnosis. First National Cancer Control Program (NCPP) in Hungary was established in 1993 and changing cancer pattern in Hungary has formed a basis for determination of priorities of the battle against cancer.

## Activities in Turkey

Activities of Head of Cancer Department of our Ministry for establishment of National Cancer Institute have been continued for 10 years. Private workshops were conducted with European Union and TEPAV in 2008, financial activity analyses and activity analyses for future of our country were completed. Law draft concerning National Cancer Institute was prepared with participation of the leading scientists and senior health managers of our country in 2009, within the following period, regulatory impact analysis and financial activity analyses of the law were performed. Similarly, in 2010, TBMM Determination of Necessary Precautions through Investigating the Issue of The Disease Cancer research commission was established. Members of the commission visited USA National Cancer Institute during research process with participation of representatives of all of our political parties and suggested in the part of final conclusion of the 648-page report that urgent measures for establishment of national cancer institute should be taken in our country.

It has been unanimously accepted that our country is over the international standards in cancer control and treatment activities but a national cancer institute is definitely required in R&D and innovation, medication and medical device innovation. In 2012 and 2013, Head of Cancer Department attended to meetings of Presidents of World Cancer Institute and Asian National Cancer Centers Alliance (ANCCA), each country assessed details of model with presidents of institutes, integrated it in TUSEB law through examining recommended solutions against R&D problems in details. TUSEB and Turkey Cancer Institute will be one of the most developed institutes that have the most powerful authorities in terms of R&D among current international samples.

In many developed countries, cancer institutes were established much earlier and it has been realized that they are organizations whose benefits have been proved in terms of both contribution to cancer control programs in their own countries and contribution to cancer researches.

When their administrative features are investigated, USA National Institute of Health (NIH) serves directly under the government, French National Cancer Institute (INCa) under Ministry of Health and Research, Korean National Health Institute under Ministry of Health. Although Canadian Health Institute was independent at its establishment, later on, it has continued to carry out its duties under responsibility of Ministry of Health.

Samples of Cancer institute which takes part as a subunit or a distinct unit independently in institutes are found in many countries such as Korea, Japan, America and France. Major functions which these institutes carry out include conduction of researchers which will determine policies and strategies against cancer of the country, determination of standards and contribution to medical licensing and planning procedures. Although the main service rendered is to conduct researches concerning cancer, training is not included within the major functions. The institute which will be established in our country has been planned to have similar functions, too.

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## CANCER ACTIVITY PLANS A

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| To establish an active cancer registration center in 81 cities | • To establish cancer registration centers within Directorates of Public Health<br>• To raise cancer registration staff | • THSK Head of Cancer Department<br>• Directorate of Public Health | • TKHB<br>• THSK Head of First-line Department<br>• THSK Directorate of Strategy Development<br>• Universities<br>• Private Hospitals<br>• WHO-IARC<br>• DB | June 2018 | • Insufficient staff<br>• Personal circulation to be intensive<br>• Substracture problems<br>• Process problems result from organizatory structure of Ministry of Health (registration centers to work under THSK, registration units to work under TKHB)<br>• Administratives to underestimate | • Number of educations concerning Basic cancer registration given<br>• Number of SEER educations given<br>• Number of Can-Reg educations given | • Current state analysis<br>• Number of Personals<br>• Number of people attending to educations<br>• Active cancer registration activities to be started in all cities in June 2014 |

# CANCER ACTION PLANS A (CONT'D)

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| To Increase Quality of Cancer Registration Data | • Raising awareness of individuals entering cancer registration<br>• Controlling of accuracy of cancer registrations<br>• Supervising of contradiction in registrations | • THSK Head of Cancer Department<br>• Directorate of Public Health | • Universities<br>• TKHB<br>• THSK Head of First-line Department<br>• THSK Directorate of Strategy Development<br>• THSK Directorate of Monitoring and Evaluation | June 2018 | • Increased of of cancer in the society<br>• Lack of labor force of raised people which will be able to work in Quality and accuracy control<br>• Healthcare personal who are supposed to enter cancer registration to underestimate | • Number of cities from which data that are used in Turkey Cancer Statistics are obtained<br>• Number of cancer registration centers present in Cancer book of IARC on Five continents<br>• Being able to give accuracy and validit numbers in terms of Turkey cancer data at the end of 2007 | • Current state analysis,<br>• Monitoring and evaluation reports prepared by THSK Head of Cancer Department<br>• To increase number of cities from which data that are used in Turkey Cancer Statistics are obtained<br>• To increase Number of cancer registration centers present in Cancer book of IARC on Five continents |

## CANCER ACTION PLANS B

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| To organize Turkey Asbestos Control Program | • Performing of current state analysis concerning asbestos<br>• To determine cities in which the program will be carried out<br>• To inform Public Health Directors via an education<br>• To collect and analyze disease data for asbestos exposure<br>• Education of village headmen fort he public to be informed<br>• To prepare and deliver brochures, banners and booklets for raising awareness of public<br>• To collect samples from houses from the regions in which asbestos exposure has been determined and to analyze them<br>• To plan rehabilitation Works in regions in which asbestos exposure has been determined following the analysis | • THSK Head of Cancer Department<br>• THSK Head of Environental Health Department<br>• Directorate of Public Health | • University<br>• Public Hospitals Association General Sekreteriat<br>• TÜBİTAK<br>• Local Authorities<br>• NGOs<br>• Ministry of Environment and Urbanization | June 2018 | • Difficulties in approaching to the data of the disease due to asbestos exposure<br>• Difficulties occuring due to geographical conditions, weather conditions and lack of staff during sampling from the environment concerning determination of asbestos exposure<br>• Delay of analyses of the samples in the laboratory | • Determination of regions with high asbestos exposure<br>• Number of individuals who have been educated about asbestos exposure and its potential effects on health<br>• Number of houses from which samplings have been performed | •Number of cities for which rehabilitation works have been planned in regions with high asbestos exposure |

# CANCER ACTION PLANS B (CONT'D)

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| To form Turkey Radon Map | • Training of the staff which will carry out the program in cities<br>• Determination of a sample based on residences representing Turkey<br>• To install radon measurement detectors in pre-determined residences<br>• To collect installed detectors after 2 months<br>• Analyses of detectors in TAEK laboratories<br>• To form Radon Map of Turkey<br>• To raise awareness of public about potential effects and protective methods against Radon gas<br>• Planning of rehabilitation works in locations with high Radon level | • THSK Head of Cancer Department<br>• Directorate of Public Health | • TAEK<br>• TÜİK<br>• Local Authorities<br>• NGOs<br>• Universities<br>• Ministry of Environment and Urbanization | June 2018 | • Sample that is supposed to represent Turkey to be extremely large and thus difficulty of staff in transportation and insufficiency of staff<br>• Rejection of public to participate in analysis<br>• Insufficient number of detectors<br>• Analyses of detectors in laboratory to take long time | • Number of educated individuals<br>• Number of individuals that accepted Radon analyses in their homes<br>• Number of detected delivered to cities<br>• Number of residences in which radon analysis performed<br>• Number of residence with high Radon analysis | • Number of delivered, collected and analyzed detectors<br>• To form Radon Map of Turkey<br>• To plan rehabilitation works in locations having high Radon analysis result |

# CANCER ACTION PLANS B (CONT'D)

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| Monitoring of Effects of Electromagnetic Fields on Health and raising awareness of public | • To follow-up new national and international literatures<br>• To attend to international meetings<br>• Serving educations for public about Effects on Health<br>• To inform public and To report and share new scientific data<br>• Preparation of new regulations based upon Scientific Developments | • THSK Head of Cancer Department<br>• Head of Environment Department | • IARC<br>• WHO<br>• ICNIRP<br>• IEC<br>• ITU<br>• Universities<br>• Ministry of Transport<br>• Ministry of Labor<br>• Ministry of Energy<br>• TEDAŞ<br>• EPDK<br>• Local Authorities | 2018 | • Presence of intensive information pollution about this issue in media.<br>• Proposed participation for educations prepared for public to fail<br>• Not following-up of scientific data shared via internet or pres by the public | • Number of national and international meetings which are organized about electromagnetic fields and are attended<br>• Number of reports and statements concerning electromagnetic fields | • Development and application of policies in compliance with international standards<br>• Learning of public the precautions that public may take in accordance with precautionary principle and starting to apply |

# CANCER ACTION PLANS C

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| To create awareness for Cancer | • In-service trainings<br>• Public educations<br>• National media campaigns<br>• Awareness activities | • THSK Head of Cancer Department | • General directorate of Health Promotion<br>• Public Hospitals Association General Sekreteriat<br>• Universities<br>• Speciality foundations<br>• Ministry of Education<br>• Ministry of Family and Social Policies<br>• NGO<br>• Media Companies<br>• RTÜK<br>• Organizations:<br>• WHO<br>• IARC<br>• UICC | 2018 | • Insufficiency of level of consciousness and education of public<br>• Screening and early diagnosis of cancer not to be made a priority issue for public<br>• Healthcare staff not to support adequately this issue and lack of motivation<br>• Lack of coordination among collaborated agencies<br>• Responsibility and power caos<br>• Sources not to be used appropriately and efficiently<br>• Financial insufficiency | • Increasing of individuals that attend to educations<br>• Status evaluation and increasing of meetings concerning filling deficiency among relevant agencies<br>• An obvious and regular increase in number of people that attend to screening program<br>• Number of patients having early-stage cancer and precancerous lesions<br>• Increase in disease-free survival and mean survival rates of cancer | • Number of educations prepared<br>• Number of people that attend to educations<br>• Number and rate of cancers diagnosed at early and advanced stage cancer in screened cancers<br>• Mortality rates for expected and occurred cancers |

# CANCER ACTION PLANS C (CONT'D)

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| To improve and extend scope of national society-based screening programs for breast, cervical and colorectal cancers | • Determination of target population that will be screened<br>• Conduction of pilot studies prior to planning<br>• Planning of studies aiming to screen 70% of the society<br>• Improvement of device, equipment and technical service qualities of centers which will perform screenings<br>• Application of standard national cancer screening programs<br>• Integration of family physicians into the screening program<br>• Formation of mobile KETEMs with mobile vehicles for breast cancer screening<br>• Establishment of regional central reporting units<br>• Screening of cervical cancer via HPV<br>• Establishment of national HPV laboratories<br>• Formation of national HPV maps<br>• Screening of colorectal cancer via GGK card tests and colonoscopy<br>• Determination of centers for diagnosis and treatment following screening and setting up of necessary technical substructure<br>• Performing quality testing of screening programs | THSK Head of Cancer Department | • Prime Ministry<br>• Health Information Systems General Directorate<br>• General Directorate of Health Promotion<br>• Relevant Units of THSK<br>• UKDK<br>• Directorates of Public Health<br>• Public Hospitals Association General Sekreteriat<br>• Universities<br>• Speciality Foundations<br>• NGO<br>• Media Companies<br>• RTÜK<br>• Organizations:<br>• WHO<br>• IARC<br>• UICC | June 2018 | • Lack of coordination among collaborated agengies<br>• Insufficiency of trained staff<br>• Deficiencies in Controlling of activities and maintenance of continuance<br>• Financial sources to be used ineffectively<br>• Lack of motivation of staff | • Procurement of 20% increase annually in number of people attending to screening program<br>• Number of patients having early-stage cancer and precancerous lesions<br>• Increase in disease-free survival and mean survival rates of cancer<br>• Reduction of treatment expenses due to early diagnosis<br>• Screening programs that are carried out to be in compliance of EU in terms of quality criteria | • At least 70% of target population that are screened to attend to the screening program<br>• Number of cancers diagnosed at early stage<br>• Reduction of mortality |

## CANCER ACTION PLANS D

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| Use of HPV test in screening for cervical cancer | • To provide education that will be given to FPs and FHC staff and women of 30-65 age range to give HPV test sample in FHCs once in 5 years<br>• To position KETEMs in CHCs and FHCs as to coordinate for cervical screening | • THSK Head of Cancer Department<br>• Directorate of Public Health | • TKHB THSK Head of First-line Department<br>• THSK Directorate of Strategy Development<br>• WHO-IARC Ministry of Finance<br>• NGOs<br>• Social leaders | June 2018 | • Insufficient staff<br>• Lack of interest in staff<br>• Personal circulation to be intensive<br>• Substracture problems<br>• Lack of supervising<br>• Society not to be interested adequately<br>• Administratives to underestimate | • Rate of patients which are invited for screening in target population of FPs to be >90%<br>• Rate of accepting the invitation to be >90%<br>• Screened people to be at least 70% of target population<br>• Reduction of rate of advanced-stage cancers among diagnosed cervical cancers and mortalities due to this disease | • Current state analysis<br>• Number of personals<br>• Number of people attending to educations<br>• At least 70% of all women population to be screened for cancer in June 2018 |

# CANCER ACTION PLANS E

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| Procurement of Palliative Care Policies to be Formal Governmental Policies | Offering for consideration from national and foreign shareholders concerning the directive regarding Palliative Care, finalization and publication of the directive | General Directorate of Health Services | Turkey Public Health Institute<br>Turkey Public Hospitals Association<br>Pharmaceuticals and Medical Devices Agency<br>Ministry of Family and Social Policies<br>Turkish Directorate of Religious Affairs | June 2018 | Difference of opinion among shareholders | Publication of the Directive | Opinions concerning the Directive |
| Giving Palliative Care Educations | • Giving start to distance education modules for family physicians<br>• Planning of hands-on training for Homecare Service Units<br>• Conduction of hands-on palliative care and chemotherapy educations for 2-3 months for specialists (internal medicine, anesthesia,pediatrics) and nurses in Public Hospitals<br>• Dedicated addition of topics about palliative care to curriculum in basic educations of physicians and nurses<br>• Conduction of awareness studies for citizens<br>• Opening and popularizing of postgraduate programs in universities for raising up Moral Support Specialists | • Turkey Public Health Institute<br>• Turkey Public Hospitals Association | • Council of Higher Education<br>• Universities<br>• NGOs<br>• Turkish Directorate of Religious Affairs<br>• Radio and Television Supreme Council<br>• Media | June 2018 | • Problems that will arise in collaboration among agengies<br>• Being unable to find voluntary staff<br>• Frequent Exchange of trained staff | • Education programs to have been started<br>• Number of trained staff<br>• Rate of palliative care services rendered by family physicians and homecare services | • Addition of it to curriculum in universities<br>• Presence of education model for family physicians<br>• Number of educations for Homecare services<br>• Number of educations given to staff working in public hospitals<br>• Number of postgraduate education programs concerning moral support specialization and of attendants<br>• Number of public educations |

# CANCER ACTION PLANS E (CONT'D)

| Strategy | Activities | Responsible Agency (ies) | Agency(ies) which will be collaborated | Completion Date | Potential Obstacles | Indicators of Development | Supervising and Control Data |
|---|---|---|---|---|---|---|---|
| Establishment of Palliative Care Centers | Doing organization and planning and publication of Palliative care | Turkey Public Hospitals Association | • Turkey Public Health Institute<br>• General Directorate of Health Services<br>• General Directorate of Health Investments | June 2018 | • Substructure problems in present hospitals<br>• Economical problems in present hospitals<br>• Insufficiency of human resources | Number of centers established | • Publication of plannings<br>• Suitability of established centers to organization schemes |
| Increasing The Use Of Opioids in Patients With Cancer | • Making necessary facilitative regulations through reviewing of current legislations concerning prescription of opioids<br>• Regulation of laws concerning opioid import and controlling of prices<br>• Giving start to local production of rapid-release morphine tablets<br>• Bringing different opioids into use<br>• Enabling and popularization of prescription of opioids by first-line physicians | • Turkey Pharmaceuticals and Medical Devices Agency | • Turkey Public Health Institute<br>• Turkey Public Hospitals Institute<br>• SSI<br>• NGO<br>• Universities | June 2018 | • Present opiophobia present in physicians<br>• Lack of coordination among collaborated agencies | Amount and variety of morphine used per capita annually country-wide | Rate of prescribing oral morphine tablets |