Cancer Strategy of the Spanish National Health System 2009

HEALTHCARE 2012
MINISTRY OF HEALTH, SOCIAL SERVICES AND EQUALITY

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Published and distributed by:

CENTRO DE PUBLICACIONES
Paseo del Prado, 18. 28014 Madrid

NIPO: 680-12-038-9

http://publicacionesoficiales.boe.es/

Cancer Strategy of the Spanish National Health System

Update approved by the National Health System Interterritorial Council on October 22, 2009

GOBIERNO
DE ESPAÑA
MINISTERIO
DE SANIDAD, SERVICIOS SOCIALES
E IGUALDAD

Plan de Calidad
para el Sistema Nacional
de Salud

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Contents

Prologue

The present Cancer Strategy falls within the framework of the National Health System Quality Plan. The first version thereof was approved at the National Health System Interterritorial Council Meeting of March 2006 for the purpose of promoting the improvement of the quality of our health system.

One of the lines of action of this Plan is that of undertaking a review of the care-providing processes which are carried out in Spain on the patients who have highly prevalent diseases entailing a major social and economic burden, one of which is cancer.

This Cancer Strategy is aimed at detecting the needs for preventing, diagnosing and treating this disease, as well as setting out working objectives and care-providing recommendations regarding which a consensus has been reached and which will be applicable to the entire National Health System.

This Strategy is the result of the cooperation among scientific societies, patient associations, expert professionals and representatives from all of the Autonomous Communities.

In June 2008, the National Health System Interterritorial Council rendered its approval of the first Evaluation Report made by the Strategy Monitoring and Evaluation Committee based on the data provided by the Healthcare Information Institute and by the Autonomous Communities proper. This first Evaluation has afforded the possibility of evaluating the indicators proposed and of reviewing the objectives and recommendations in terms of the new knowledge available.

The update of the original Strategy document presented herein was prepared based on the conclusions of that first evaluation and the review of the scientific evidence available.

This Strategy means a chance to optimize the prevention, diagnosis and treatment of cancer, as well as to improve the cancer information and enhance cancer research.

The aim is also to offer support at the national level in coordinating and carrying out health prevention and promotion plans or programs, as well as diagnostic means for the early detection of cancer and seeking progressively more effective treatments.

This Strategy includes seven (7) lines of action: health promotion and protection early detection, provision of care, palliative care, quality of life and research.

Addressing cancer with precision requires a number of measures being taken to determine tested and proven criteria regarding which a consensus is reached concerning the guidelines to be followed in any of the aforementioned lines of strategy so as to achieve greater effectiveness and quality in dealing with this disease in all the health services comprising Spain's health system. To this end, the document sets out a set of objectives and recommendations aiming to contribute to improving the quality of the interventions and results of the services and of the health care provided.

Lastly, I would like to thank all those individuals and organization who have taken part in preparing this document, especially Dr. Josep María Borrás Andrés, the scientific coordinator for this Strategy, given that without his dedication and effort, it would not have been possible to avail of a tool which will undoubtedly be contributing to improve the quality of the care provided to cancer patients and their families.

Trinidad Jiménez García-Herrera
Minister of Health and Social Policy

Introduction

The Cancer Strategy of the Spanish National Health System proposed in following in this document is based on two main lines. On one hand, the scientific evidence available on the effectiveness of different measures for reducing the incidence of cancer and improving the diagnosing and treatment thereof and, on the other, the evaluation of the Strategy approved in June 2008 by the Interterritorial Council which reviewed the advancements made since the start thereof in 2005.

The Strategy started in 2005 essentially focused its efforts on some top-priority objectives:

- The prevention of tobacco smoking, although this comprise part of objectives encompassing the vast majority of chronic diseases and not only cancer, reducing smoking, as has been achieved, being a highly important result. However, it must also be noted that there is still as yet a long way to go in this area in our country. In the other risk factor taken into account, obesity, especially childhood obesity, this Strategy is far from achieving the set objectives.
- The confirmation of the full coverage of Spain's entire population of women included in the breast cancer screening target group, who took part in a large percentage of the population programs to which they are invited in all of the Autonomous Communities is another major advancement.
- In the care-providing sphere, a multidisciplinary working model based on tumor committees was established. The evaluation of this aspect was more difficult due to the characteristics thereof per se. Also worthy of special mention is the boost which different Autonomous Communities have given to the clinical practice guides and to the consolidation of the specialized pediatric oncology units, which following the internationally-established criteria.
- Mention may also be made of the coordination promoted by the Palliative Care Strategy of the Spanish National Health System, as well as the important role assigned to the quality of life-related aspects which are also dealt with in the Strategy.
- Lastly, cancer research has been carried out in Spain organized around the cooperative research networks promoted by the Carlos III Health Institute, particularly the cancer-focused research network which groups together most positively-evaluated research groups who are research along the different basic, preclinical, clinical and epidemiological lines.

The advances made were evaluated by the Interterritorial Council as being highly positive - this being the first Strategy for which this was so – in July 2008, based on the results of the proposed indicators prepared by the Ministry's technical personnel and evaluated jointly by the Strategy Monitoring and Evaluation Committee. They undoubtedly comprise the most appropriate basis for determining what our priorities are going to be over the upcoming years.

The objectives for the next period are discussed in the following chapters. Some points worthy of special are:

- The analysis of the impact of cancer in our country, updated and presented in the situation analysis, indicates the preeminence being taken on by colorectal cancer, in conjunction with the need of continuing the prevention of the tumors related to tobacco and diet, promoting the prevention of the smoking habit and moving forward in the currently insufficient legislation.
- Colorectal cancer screening must be progressively extended to all males and females within the 50-69 age range.
- Providing multidisciplinary care as a paradigm of the quality care model must be one objective on which the care-providing, diagnostic and treatment services involve in providing cancer care must focus their efforts. Availing of oncoguides shared by the entire National Health System must be a key aspect to provide cancer patients with guidance as to the minimum aspects with which they must be provided in cancer treatment throughout the entire National Health System. The other essential objective must be that of continuing the work carried out by the specialized pediatric oncoguide units.
- Advancement in the quality of life-related aspects and the improvement of the adverse effects of the disease or treatment, such as psychological cancer care, rehabilitation of lymphedema or of other effects must be dealt with by the different health services.
- One aspect which is becoming more important by the day is the long-term care of surviving patients, which is a problem which uniquely comes to bear in pediatric oncology and which must be evaluated in order to decide what actions are most effective in collaboration with the patients associations.
- Consolidating and enhancing the different realms of cancer research in our country is one key aspect which must be continued, being supported by the different agencies involved.

These objectives must be evaluated by using tools which will afford the possibility of ascertaining the preventive and clinical practice and being able to know what the opportunities are for further improvement in the future.

But perhaps the most important aspect is that of continuing the cooperative working model set up among the different Autonomous Community representatives, experts from scientific societies, technical personnel from the Ministry and representatives from volunteer and patients associations which was established by the first scientific coordinator for this strategy, Professor Díaz Rubio, which I hope to be able to continue over the next few years in order to be able to make it possible to progress in cancer prevention and control in our National Health System. Equity and effective action in the fight against cancer in a complex health system such as ours can only be achieved with this cooperative willingness which makes it possible to move ahead in reducing the incidence and improve the prognosis and the quality of life of cancer patients.

Josep Maria Borrás Andrés
Cancer Strategy Scientific Coordinator

Justification

The Cancer Strategy of the Spanish National Health System was approved by the National Health System Interterritorial Council in March 2006, encouraged and supported by the Ministry of Health and Social Policy. This approval was the result of a fruitful coordination effort and consensus among the Autonomous Communities, the cancer-related scientific societies and the patients associations, headed by the Scientific Coordinator (who was Dr. Díaz Rubio at that point in time).

The National Health System Interterritorial Council stipulated that an evaluation be made of the Strategy two years immediately following approval thereof, for which purpose the Monitoring and Evaluation Committee was formed in September 2007, being comprised of the members of the Technical Committee (scientific societies and patients associations) and the Institutional Committee (representatives from the Autonomous Communities), which reached a consensus in favor of a methodology for the evaluation thereof, determining the operating method for collecting information and the reference sources to be used in each case.

The Technical Secretariat for the Strategy, created for this purpose and operating under the Quality Agency, with the data and information furnished by the Autonomous Communities and the data extracted from the information systems provided by the Health Information Institute, prepared the Evaluation Report approved by the National Health System Interterritorial Council in June 2008.

The analysis of the evaluation results provides valuable information concerning the actual situation of cancer in Spain, which, in conjunction with the available scientific evidence, gave rise to the objectives being redefined. The work done in the course of the months to follow setting out actions, recommendations and objectives has now taken the form of this new edition of the Strategy. The next evaluation is set out to be made four years from now, with a partial evaluation two years from now.

This Cancer Strategy Update incorporates all of the knowledge and data available to date regarding this disease, collaborating toward putting the situation of cancer in Spain up to date. In short, the objective is to aid toward improving the services provide nationwide for those affected by this type of disease based on the principles of quality, equity and cohesion, precisely as set forth under the Quality Plan.

Technical organizational note

This document is comprised of five sections:

Generalities: This section deals with the methodology of this document, definition of concepts, current situation of cancer in Spain and background aspects of the Strategy.

Further details of the lines of strategy: Detailing the objectives and the recommendations for action which are suggested for each one thereof, agreed upon by the Monitoring and Evaluation Committee, to contribute to improving the quality of the interventions and results in cancer.

The following lines of strategy were defined:

- Strategy Line 1: Health Promotion and Protection
- Strategy Line 2: Early Detection
- Strategy Line 3: Adult Care
- Strategy Line 4: Child and Adolescent Care
- Strategy Line 5: Palliative Care
- Strategy Line 6: Quality of Life
- Strategy Line 7: Research

Evaluation and Information Systems: This section includes the monitoring and evaluation indicators for the respective objectives set forth.

List of Acronyms and Abbreviations

Bibliography

1. Generalities

1.1. Methodology

The work of drafting the Cancer Strategy of the Spanish National Health System started off with the creation of two committees: the Technical Committee and the Institutional Committee.

- The **Technical Committee** comprised of representatives from scientific societies and other professionals of well-known prestige, as experts on the subject. The TC made the strategy analysis and diagnosis of the situation of cancer in Spain, set out the lines of strategy and the description of all the basic common objectives as a whole to be achieved, as well as drafting the specific recommendations for the purpose of achieving these objectives.
- The **Institutional Committee**, comprised of the 17 representatives appointed by the Autonomous Communities and INGESA (for the Autonomous Cities of Ceuta and Melilla), which evaluated the appropriateness and feasibility of the objectives, indicators and recommendations proposed.

The Cancer strategy was approved by the National Health System Interterritorial Council at the meeting held thereby on March 29, 2006.

In 2007, the Strategy Monitoring and Evaluation Committee was formed for the purpose, as its name proper indicates, of establishing the system for monitoring and evaluating the Strategy. Said Committee was formed both by the Institutional as well as the Technical Committees, in conjunction with other representatives from scientific societies and patients associations, who were unable to take part in the preparation process for different reasons.

The Institutional Committee and the Technical Committee were maintained as sub-working groups. The Institutional Committee, in charge of establishing the system for collecting the necessary information, the information source for which is the Autonomous Communities and the Technical Committee, in charge of preparing both the proposal for updating objectives as well as the resulting recommendations for taking action for the purpose of achieving said objective, as well as for proposing improvements of changes based on recent scientific evidence.

The evaluation of the Cancer Strategy of the Spanish National Health System consisted of assessing the degree to which the objectives set out are met by means of collecting data stipulated in the evaluation indicators and the proposal for updating the contents of the Strategy, as well as any possible actions for improvement.

The information necessary for evaluating the objectives set out was obtained from both the Autonomous Communities and the Ministry of Health and Social Policy through the Health Information Institute operating under the Quality Agency of the National Health System.

The evaluation planning work began in early 2008 with the debate and approval of the form for collecting information by means of which the information was going to be collected from the Autonomous Communities. The working plan and schedule were also presented for the preparation of the Strategy Evaluation Report, including the technical review of objectives on the part of the Technical Committee. After the questionnaire was sent out to the Autonomous Communities and the data collected, the Strategy Secretariat (Health and Quality Planning Office) drafted the proposed Evaluation Report once a consensus had been reached with regard thereto by the Strategy Monitoring and Evaluation Committee and was submitted to the respective approval by the National Health System on June 18, 2008. This process fully complies with the agreement reached in the Strategy Monitoring and Evaluation Committee, which stipulated making an initial evaluation of its objective two years subsequent to the approval of the Strategy.

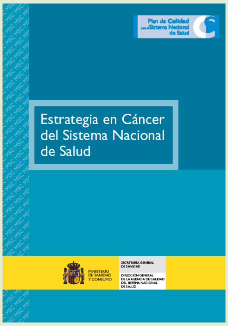
Following the conclusion of the evaluation process, the Strategy Updating phase then began, the result of which is the document herein. The Strategy Monitoring and Evaluation Committee met at the beginning of 2009 to set out the proposal for updating the Strategy objectives, recommendations and indicators, as well as the sharing out of tasks for the new drafting of the text thereof.

The updating of contents includes the modifications stemming from final results of the evaluation process, in conjunction with the compiling and updating of the information on cancer based don the scientific evidence available to date. In other words, the final updated Strategy document presented herein is comprised of the changes and improvements related to objectives, recommendations and indicators as well as to the scientific and technical contents thereof.

The Strategy update was reviewed and brought to consensus by the Strategy Monitoring and Evaluation Committee in September 2009, as of which time the Strategy was then forwarded to the National Health System Institutional Committee for the approval thereof in October.

Cancer Strategy of the Spanish National Health System Evaluation, Monitoring and Updating Schedule

The **EVALUATION** was begun two years immeditaly following its appproval


Estrategia en Cáncer
del Sistema Nacional
de Salud

Approved
March 29, 2006

September 2007	January 2008	May 2008	June 2008
The Strategy Monitoring and Evaluation Committee Formed	First Monitoring and Evaluation Committee Meeting (qualitative form approved)	Monitoring and Evaluation Committee Meeting (Evaluation Report approved)	Evaluation Report presented and approved by the National Health System Interterritorial Council

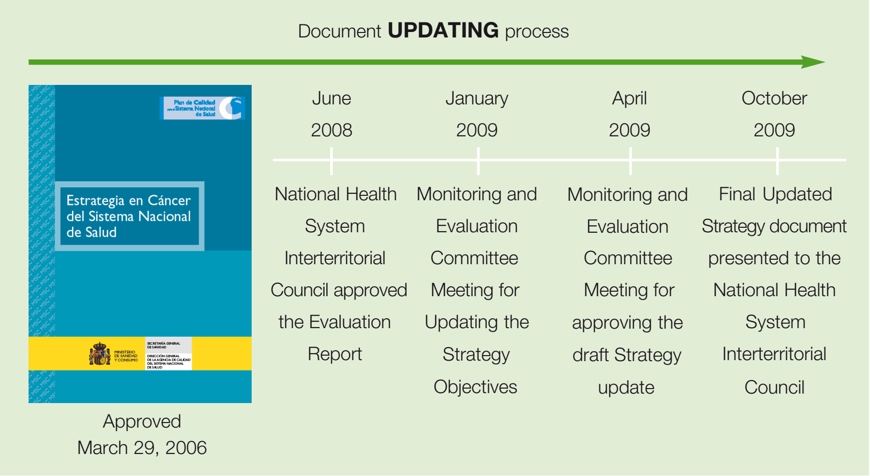
2007

- **September 29, 2007:** Face to face meeting for the Official Forming of the Cancer Strategy Monitoring and Evaluation Committee. Supporting Technical Secretariat created.
- **October-November:** Questionnaire form designed for the Autonomous Communities to collect the information necessary for the Evaluation.
- **November-December:** The proposed form for collecting information was sent to the Autonomous Communities for them to send in their contributions. The data sheet was sent to the Technical Committee for the review of objectives and for any contributions to be furnished.
- **December:** The contributions from the Autonomous Communities and Technical Committee were collected.

2008

- **January**: Report completed with the contributions made by the Autonomous Communities and Technical Committee was mailed.
- **January 22nd:** Face to face meeting of the Monitoring and Evaluation Committee for the approval of the form for collecting final information and the report revising the Strategy objectives.
- **March 29th:** Date on which the Autonomous Communities began collecting information.

- **April-May:** The forms for collecting information for the evaluation which had been sent in by the Autonomous Communities were received.
- **May:** The Draft Strategy Evaluation Report was prepared.
- **May 27th:** Face to face meeting of the Monitoring and Evaluation Committee for the approval of the Strategy Evaluation Report.
- **June 2008:** The Report was submitted to the National Health System Interterritorial Council for the final approval thereof.



2009

- **January-April:** Proposals prepared for the updating of the objectives, recommendations and indicators.
- **January:** Face to face meeting of the Monitoring and Evaluation Committee. Review of objectives and working plan for updating the contents of the Strategy.
- **May-September:** Document contents updated.
- **April:** Monitoring and Evaluation Committee met to approve the draft update of the Strategy.
- **June-September:** Final document prepared.
- **October:** The final Strategy document was presented to the National Health System Interterritorial Council.

1.2. Definitions of concepts

The **objectives** are the goals to be achieved and are applicable to the entire population targeted. All of these objectives have been included in the different recommendations of the scientific societies, patients associations and authorized institutional bodies. The objectives are achievements, not the preparation of tools or instruments, and must therefore be monitored, quantified and updates.

The **indicators** are measurements of processes or results which are essential for evaluating the effectiveness of the Cancer Strategy of the Spanish National Health System and which, in short, will provide clear, consistent, updated information.

The **recommendations** are the general activities which are necessary to be carried out, one way or the other, according to the different organizational criteria of the different Administrations. The recommendations contribute to guaranteeing that the objectives will be achieved and are subject to the changes proper of the flow and advancement of knowledge. They must therefore be updatable.

1.3. Current situation of Cancer in Spain

As in most Western countries, cancer is currently one of the major diseases or groups of diseases in terms of public health in Spain. Malignant tumors have been the second leading cause of death in Spain over recent decades, surpassed only by circulatory system diseases, although have been ranked in first place since 2005 among males. The latest figures available indicate that, in 2006, three out of every 10 deaths among males and two out of every 10 deaths among females were caused by this disease.

In addition to the high death rates, cancer is associated with a high burden of morbidity. In 2000, the loss of years of life due to cancer, adjusted in terms of disability, was 21 years for every 1000 inhabitants, thus totaling 16% of the total disease burden of Spain's population (Fernández et al., 2009). Lung, colorectal and breast cancers were the tumors responsible for the greatest number of years of healthy living lost. The first two, due to their high mortality rate, and the breast tumors due to the high burden of disability they entail.

However, despite cancer continuing to be a major public health problem, the mortality and incidence trends for some types of tumors are being found to be reversing, suggesting that both the primary and secondary prevention policies as well as the improvements made in the treatments are being effective.

The objective of this report is to describe the current situation of cancer in our country by employing the incidence data available in the International Agency for Research on Cancer (IARC) (Parkin et al. 2005) and the mortality data furnished by the National Institute of Statistics (INE) up to 2006, showing the mortality and incidence patterns for Spain as a whole and for the different Autonomous Communities, as well as the mortality trend by the different types of cancer for the last ten years (1997-2006). The EUROCARE-4 study (Sant el al., 2009) has been used as a source of survival and prevalence data for the different tumors.

The end purpose of this information is to serve as support for setting priorities in the health policies in Spain and thus contributing to reducing the burden of cancer on our population, as well as reducing the inequalities existing among the different geographical areas of Spain.

1.3.1. Incidence

The incidence of cancer within a geographically-defined population can be ascertained thanks to the existence of population-based records, the main end purpose of which is to identify and keep a running account of all the new cases which are diagnosed in those residing within the area in question. The population cancer records, which are indispensable for estimating the prevalence of this group of diseases and for evaluating the survival of these patients, are therefore key tools in epidemiological cancer surveillance. These records make it possible to quantify the incidence of cancer in specific cohorts followed over the course of time, facilitate the evaluation of the early diagnosis programs and are highly useful for conducting studies of cases and controls in research on risk factors. The information they provide has many times enabled the health authorities to avail of sufficient data to evaluate and deal successfully with different health crises related to environmental exposures.

At the international level, the main source of information of cancer incidence is the IARC, an agency operating under the World Health Organization (WHO) which regularly publishes the incidence data of those population records which meet the quality criteria set out in the series *Cancer Incidence in Five Continents* (CIFC. Parkin et al. 2005). The CIFC Volume IX, the latest volume published, includes the incidence figures for the 1998-2002 reference period (Curado MP et al., 2007). Based on this date, estimates have been made of the incidence rates for Spain as a whole and for the European Union (EU) countries for most types of cancer in 2006, thus affording the possibility of determining what the situation of cancer is in Spain within the context of the EU (Ferlay et al., 2007; ECO-OEC, 2009). **Table 1** shows the estimated incidence rates adjusted to the European population for the most important types of cancer. In those countries which have national cancer registries, this data is from those registries. However, in other countries, such as in the case of Spain, solely estimates based on data from regional registries is available.

According to this data, in 2006 a total of 2,394,952 new cases of cancer were diagnosed in the EU27 (ECO-OEC, 2009).

In males, prostate cancer was the most frequent cancer, followed by lung cancer and colorectal cancer. In females, the cancer most commonly diagnosed was breast cancer, followed by colorectal cancer and lung cancer.

According to the published estimates, Spain had rates adjusted to the European population which were lower than the average for the EU27 for males, ranked at an intermediate level, ranked twentieth (416.9 cases/100,000 males). The lowest incidence rates were found in Malta and Bulgaria (around 300 cases / 100,000 males), the highest rates having been found in Belgium, France, Hungary, Ireland and Lithuania, with over 500 cases/100,000 males.

In Spain, this intermediate situation, below the overall EU27 rate, held true for the most important tumors: prostate, lung and colorectal.

In females, the estimated incidence rates for Spain were, in conjunction with those of Greece, the lowest in the EU (263.40 cases/100,000 females). In the EU27, other countries having a low incidence rate were Lithuania, Bulgaria and Cyprus (less than 270 cases/100,000 females), whilst the countries showing the highest rates were Denmark and Hungary (figures of over 400/cases/100,000 females). The colorectal and uterine cancer rates were very low among Spanish females compared to females from other European Union countries. The breast, colorectal and stomach cancer incidence rates were ranked at an intermediate level, although always below the European average.

Tables 2 and **3** show the incidence rates adjusted with the standard European population for males and females published in CIFC Volume IX (Curado MP et al., 2007), these rates being from the following Spanish registries: Albacete, Principality of Asturias, Canary Islands, Cuenca, Girona, Granada, Mallorca, Murcia, Navarre, Tarragona, Basque Country and Zaragoza.[1]

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[1] The data from the Valencia Childhood Tumor Population Record, also recognized by the IARC, which are not incorporated into CIFC due to not focusing solely on one subgroup of tumors is included in a separate section. This registry started operating in 1986, although it has information starting as of 1983. In addition to the aforementioned registries, the Rioja Cancer Registry, the Cantabrian Tumor Registry, the Autonomous Community of Valencia Tumor Registry and the Castelló Tumor Registry (which collected data solely on breast cancer at the beginning, but which has incorporated colon and rectal cancer since 2006) and the Spanish Multicenter Hospital Leukemia Registry are all associated to the European National Cancer Registry (ENCR) Network or to the International Association of Cancer Registries (IARC).
It is important to point out that an effort is being made through the Autonomous Communities and the Ministry of Health and Social Policy for the majority of Spain's territory to be covered by population-based cancer registries. Thus, the Cancer Registry of Extremadura, the Cancer Registry of Malaga, the Cancer Registry of Toledo, the Cancer Registry of Guadalajara, the Cancer Registry of Talavera de la Reina, the Gynecological and Breast Cancer Registry of Castile and Leon, the General Practitioners' Cancer Incidence and Mortality Registry (RINCAM) are also operating, there also being others recently created, such as the Population-Based Cancer Registry of Castile and Leon (2005), the Cancer Registry of Andalusia (2007) and the Galician Tumor Registry (2009), some of which are still not as yet generating data.

During the 1998-2002 period, the total incidence of cancer (excluding non-melanoma skin cancer) in Spain's registries was of 324-511 cases / 100,000 males and of 204-286 cases/100,000 females. The highest incidence of cancer in males was found in the Basque Country and Girona, with adjusted rates nearing 500 cases / 100,000 individuals/year. The lowest incidence was found in the Cuenca Registry, showing rates lower than 325 cases/100,000 individuals/year. In most of Spain's registries, a very high incidence of tumors was found to be related to alcohol and tobacco use (tumors of the larynx, esophagus, lung and bladder).

In all of Spain's registries, prostate cancer, lung cancer and colorectal cancer were the three tumors most frequent in males, given that they total 55%-62% of the cases.

By specific locations, there are strikingly high rates of colon cancer in the Basque Country, Girona and Tarragona; stomach cancer in the Basque Country, Asturias and Navarre; liver cancer in the Basque Country, Asturias and Girona; esophageal cancer in the Basque Country, Asturias and Navarre; prostate cancer in the Basque Country, Canary Islands, Girona and Navarre; non-Hodgkin lymphoma in Tarragona and the Basque Country. The lung cancer rates were very high in all the registries, especially in Asturias, the Basque Country and Girona, followed by the Canary Islands, Murcia, Navarre, Tarragona and Zaragoza.

Regarding females, in all of Spain's registries, breast cancer was the most frequent tumor, responsible for more than 25% of the cancer cases, following by colorectal cancer and endometrial cancer. The highest rates were recorded in Girona, the Basque Country, Navarre and Tarragona, the lowest incidence rates having been recorded in Albacete, Cuenca and Zaragoza. The registries showing particularly high breast cancer incidence rates are those of Girona, Navarre, Tarragona, the Basque Country and the Canary Islands.

The colon cancer incidence rates were highest in the Basque Country and Girona; the liver cancer rates in the Basque Country, Canary Islands, Girona and Tarragona. Lung cancer was considerably more frequent in the Canary Islands, the Basque Country and Asturias; and bladder cancer in Tarragona and Navarre. Lastly, the highest incidence of cervical cancer was recorded in the Canary Islands, whilst the highest rate for ovarian cancer was found in Asturias.

Table 1. Cancer incidence rates in the European Union countries, estimated for 2006. Rates per 100,000 inhabitants adjusted to the standard European population. Prepared by authors based on data from the European Cancer Observatory (http://eu-cancer.iarc.fr).

	Males						Females							
Country	Stomach	Collorectal	Lung	Prostate	Bladder	All	Stomach	Collorectal	Lung	Bladder	Breast	Cervical	Ovarian	All
EU27	18.8	58.2	72.1	102.3	29.2	457.7	8.4	35.2	21.3	5.5	107.6	13.8	13.5	322.7
GERMANY	17.6	70.2	61.2	113.0	23.3	451.4	8.5	45.1	20.8	6.1	121.2	13.3	13.1	333.7
AUSTRIA	14.3	57.6	54.0	134.6	30.7	444.6	8.8	30.9	22.3	9.1	91.5	12.4	14.9	294.6
BELGIUM	10.3	53.3	93.0	160.8	52.9	543.3	3.8	34.3	22.9	7.3	137.8	13.0	16.1	343.1
BULGARIA	25.5	49.6	67.3	36.0	24.9	336.6	13.6	31.3	11.5	4.2	74.0	22.5	18.5	269.0
CYPRUS	16.2	41.2	66.1	74.6	26.2	373.7	8.7	29.0	9.5	4.6	88.4	13.7	12.0	269.6
DENMARK	9.1	61.0	65.0	80.3	42.5	442.0	4.5	48.0	48.7	12.3	122.6	16.8	18.7	413.6
SLOVAKIA	25.2	87.1	71.7	51.2	19.7	434.4	10.3	42.6	11.6	5.4	69.7	21.2	15.7	288.4
SLOVENIA	27.5	69.0	75.6	70.2	23.8	438.5	11.0	36.3	22.9	5.5	87.5	20.7	14.8	319.0
SPAIN	**15.9**	**54.4**	**68.3**	**77.2**	**42.5**	**416.9**	**8.4**	**25.4**	**13.8**	**4.0**	**93.6**	**10.3**	**8.9**	**263.4**
ESTONIA	33.4	50.0	80.3	65.3	27.6	411.1	17.5	33.9	13.2	5.2	71.1	21.7	17.3	298.5
FINLAND	11.8	39.2	45.8	149.7	18.4	406.0	6.8	29.4	14.7	4.0	119.8	5.5	14.5	314.0
FRANCE	12.0	59.8	75.5	133.5	27.3	527.5	4.5	36.8	15.0	3.2	127.4	13.2	12.0	329.0
GREECE	18.9	31.0	88.7	81.0	36.0	423.9	8.9	21.3	12.7	5.4	81.8	8.5	10.6	259.5
HOLLAND	13.4	61.2	63.4	98.4	40.3	435.0	6.3	43.9	32.5	10.0	128.0	8.9	9.4	355.4
HUNGARY	26.6	106.0	119.3	85.6	43.2	598.8	10.9	50.6	42.4	9.7	118.0	19.0	15.7	408.7
IRELAND	14.7	65.2	60.2	182.0	22.2	513.6	7.6	36.9	34.1	9.1	131.4	8.9	16.6	382.2
ITALY	22.1	52.0	84.7	108.4	39.6	499.7	11.1	30.3	15.6	6.1	105.3	10.1	11.2	323.6
LATVIA	28.6	47.0	82.5	85.7	23.3	419.4	14.6	28.7	10.2	4.1	64.8	12.3	19.4	265.2
LITHUANIA	36.8	53.1	91.9	109.7	33.3	500.1	17.9	32.5	9.9	4.8	68.7	21.5	23.0	320.5
LUXEMBOURG	14.8	61.9	69.8	93.6	22.5	440.0	5.4	36.1	16.3	4.6	116.9	14.5	12.0	279.5
MALTA	13.7	51.5	43.9	68.8	16.4	322.8	7.1	36.2	6.5	4.3	94.5	6.8	13.7	279.5
POLAND	34.8	43.1	103.0	51.0	25.3	443.2	8.8	27.7	28.6	3.7	74.1	20.3	16.3	311.9
PORTUGAL	28.9	58.9	44.5	101.2	24.1	427.8	15.4	30.9	11.7	3.9	103.5	18.8	6.8	289.4
CZECH R.	17.0	94.4	78.9	76.1	30.9	484.0	8.2	46.0	22.9	8.5	84.8	21.9	19.4	346.0
U.K.	14.3	54.9	57.1	107.3	16.0	410.5	5.7	34.8	34.6	4.8	122.2	11.0	17.9	348.9
ROMANIA	30.6	40.7	81.0	32.2	18.0	371.8	13.0	25.1	15.4	3.1	61.2	25.5	12.4	279.1
SWEDEN	9.2	49.2	28.6	157.2	27.8	418.2	4.9	37.4	23.8	7.9	125.8	11.1	14.0	361.3

Table 2. Cancer incidence rates adjusted to the European population in Spain's different population registries. Males (cases/100,000 males).

	Albacete	Asturias	Canary Islands	Cuenca	Girona	Granada	Murcia	Navarre	Tarragona	Zaragoza	Basque Country
TUMOR	**1998-2002**	**1996-2002**	**1997-2002**	**1998-2002**	**1998-2002**	**1998-2002**	**1997-2002**	**1998-2002**	**1998-2002**	**1996-2002**	**1998-2002**
ORAL AND PHARYNX	26.35	26.7	34.95	23.1	23.2	29.2	28.5	23.3	23.9	16.3	32.15
ESOPHAGUS	5.47	9.94	11.37	4.79	9.38	5.03	5.61	6.78	8.03	6.39	12.34
STOMACH	18.80	23.81	15.54	19.03	18.47	16.17	17.82	23.69	18.56	18.40	28.82
S. INTESTINE	0.41	1.03	0.88	0.48	1.59	0.98	1.33	1.16	0.88	0.65	1.11
COLON	22.10	35.71	28.77	25.81	43.26	27.09	34.91	33.97	39.39	26.75	41.03
RECTUM	17.18	19.48	16.62	15.56	21.79	16.47	22.94	24.32	21.22	16.88	25.94
LIVER	7.49	14.16	12.48	6.96	13.32	11.70	9.99	11.65	12.10	7.45	15.84
PANCREAS	7.81	8.36	12.01	8.14	9.75	7.03	8.89	12.27	8.72	6.36	11.05
NASAL CAVITY	0.27	2.37	1.11	0.47	0.57	0.76	0.46	1.05	0.76	1.28	1.22
LARYNX	13.92	20.55	15.12	14.68	13.75	15.70	20.02	18.45	16.70	21.36	22.54
LUNG	56.39	82.46	72.25	56.15	79.90	63.15	73.79	75.22	72.17	70.57	79.85
OTHER THORACIC	0.76	0.54	0.76	0.36	0.81	0.54	0.91	0.95	1.19	0.68	1.07
BONES	1.20	1.47	0.94	0.45	1.92	1.09	0.98	1.18	0.83	1.47	1.41
MELANOMA	6.76	4.62	5.43	4.45	7.05	5.55	8.66	9.18	8.04	5.21	6.53
CONNECTIVE TISSUE	1.67	2.21	2.64	2.37	3.67	3.24	2.67	2.27	2.60	2.34	3.03
BREAST	0.45	0.80	0.87	0.64	0.50	0.75	0.85	0.91	0.78	0.68	1.02
OTHER MALE GENIT.	0.00	0.29	0.25	0.00	0.12	0.11	0.20	0.23	0.16	0.12	0.35
PROSTATE	63.03	71.79	85.20	47.81	88.52	44.54	61.29	86.98	67.68	62.90	84.28
TESTICLE	3.37	2.27	2.20	3.17	3.92	2.30	2.70	2.62	3.72	2.50	3.20
KIDNEY	6.91	13.40	6.30	6.95	10.42	6.25	7.14	13.16	8.69	8.01	16.19
BLADDER	41.34	44.01	32.98	33.62	53.08	45.06	56.29	54.09	56.37	45.26	47.59
EYE	1.24	0.56	0.70	0.36	0.64	0.75	0.44	0.68	0.51	0.63	0.67
CNS	8.10	7.20	7.28	7.89	8.29	6.27	6.81	9.28	8.03	6.20	8.59
THYROID	1.37	1.80	2.32	1.44	2.86	1.27	2.42	3.25	1.94	1.71	2.01
OTHER ENDOCRINE G.	0.43	0.24	0.04	0.00	0.15	0.30	0.26	0.06	0.23	0.13	0.06
POORLY-DEFINED T.	13.07	25.52	18.86	7.84	17.91	15.58	14.31	13.21	15.25	7.00	19.77
HODGKIN	2.16	2.44	2.06	1.60	3.10	2.24	2.77	2.81	3.04	2.82	4.02
NHL	8.04	13.77	17.82	7.43	16.40	11.44	13.00	14.47	15.76	12.09	14.19
MYELOMA	4.78	4.71	5.21	6.42	4.78	4.16	5.07	3.02	4.76	4.36	4.61
LYMPH. LEUK.	6.09	5.46	5.43	3.51	3.99	4.88	5.43	4.19	4.51	5.34	5.13
MYEL. LEUK.	3.70	4.34	5.24	2.33	5.02	4.56	5.94	4.17	5.51	3.15	3.42
MALIGNANT T. (SKIN)	363.53	467.43	434.34	323.96	486.46	365.36	433.90	471.91	446.38	372.79	511.44
TOTAL	**365.94**	**467.43**	**512.71**	**435.36**	**324.58**	**583.80**	**482.88**	**510.06**	**603.05**	**555.80**	**445.79**

Prepared by authors based on CIFC date. Volume IC (Curado et al, 2007).

Table 3. Cancer incidence rates adjusted to the European population in Spain's different population registries. Females (cases/100,000 males).

	Albacete	Asturias	Canary Islands	Cuenca	Girona	Granada	Murcia	Navarre	Tarragona	Zaragoza	Basque Country
TUMOR	**1998/2002**	**1996/2002**	**1997/2002**	**1998/2002**	**1998/2002**	**1998/2002**	**1997/2002**	**1998/2002**	**1998/2002**	**1996/2002**	**1998/2002**
ORAL AND PHARYNX	3.55	4.11	4.40	3.85	3.56	4.58	4.66	3.89	3.31	2.70	5.00
ESOPHAGUS	0.33	0.81	1.35	0.48	1.32	0.59	0.64	0.92	0.73	0.56	1.22
STOMACH	8.74	9.82	7.36	7.60	9.75	8.13	9.03	10.27	8.04	8.50	10.65
S. INTESTINE	0.52	0.75	0.62	0.94	0.50	0.50	0.51	0.54	0.62	0.59	0.66
COLON	17.81	19.07	20.95	18.60	27.56	18.97	24.44	21.34	25.90	16.76	20.98
RECTUM	6.97	8.50	9.83	8.01	10.82	9.15	11.18	10.81	11.31	10.16	11.12
LIVER	2.91	2.71	4.71	3.14	4.39	3.71	3.27	3.00	4.07	2.58	4.67
PANCREAS	4.24	4.86	6.84	4.26	6.38	4.97	4.87	6.73	7.08	4.19	7.03
NASAL CAVITY	0.20	0.54	0.37	0.43	0.21	0.23	0.20	0.32	0.39	0.34	0.37
LARYNX	0.28	0.64	0.66	0.00	0.25	0.24	0.64	0.54	0.34	0.54	1.12
LUNG	4.85	8.11	10.52	4.86	7.45	4.60	6.77	9.46	5.88	5.59	9.70
OTHER THORACIC	0.72	0.51	0.23	0.54	0.45	0.20	0.39	0.34	0.49	0.35	0.43
BONES	0.83	0.71	0.58	0.59	1.08	0.43	0.98	0.48	1.33	1.38	0.67
MELANOMA	6.31	7.52	6.47	3.04	8.48	6.16	8.85	9.26	10.04	5.29	8.44
CONNECTIVE TISSUE	1.27	1.89	1.61	3.65	1.79	2.52	1.71	2.22	2.36	1.89	1.95
BREAST	63.81	72.22	82.76	60.23	90.30	75.04	77.05	88.61	86.13	73.47	86.61
OTHER FEMALE GENIT.	1.27	0.77	0.65	0.47	0.46	0.13	0.51	0.27	0.54	0.25	0.54
CERVIX	6.69	9.07	11.37	6.76	8.44	7.69	8.58	5.47	9.27	5.33	6.42
CORPUS UTERI	14.89	14.56	16.39	16.42	18.37	19.18	17.14	20.24	17.61	15.29	16.19
OVARY	8.66	15.44	10.56	11.37	10.84	10.93	11.13	12.29	11.02	9.46	10.89
PLACENTA	0.00	0.00	0.00	0.00	0.06	0.04	0.00	0.06	0.23	0.00	0.04
KIDNEY	3.55	4.70	3.09	3.98	4.50	3.80	3.49	4.49	3.78	3.75	5.54
BLADDER	4.76	5.69	4.15	5.09	7.19	4.51	6.38	7.50	8.20	5.62	6.85
EYE	0.46	0.49	0.22	0.42	0.37	0.18	0.34	0.45	0.68	0.42	0.50

Table 3. Cancer incidence rates adjusted to the European population in Spain's different population registries. Females (cases/100,000 males).

CNS	3.79	5.95	5.33	5.55	6.40	4.52	4.62	6.95	7.68	4.72	6.56
THYROID	5.57	5.64	7.75	3.81	7.80	8.93	8.78	12.09	5.33	4.98	4.92
OTHER ENDOCRINEL G.	0.19	0.11	0.05	0.00	0.00	0.12	0.06	0.08	0.14	0.13	0.09
POORLY-DEFINED T.	9.00	11.58	10.15	6.45	10.49	8.80	8.67	8.25	8.97	3.42	9.97
HODGKIN	1.46	2.25	1.76	1.41	1.72	1.37	1.80	2.51	2.06	1.77	2.45
NHL	8.56	10.46	13.93	4.58	12.45	8.17	9.65	10.63	11.12	8.47	9.88
MYELOMA	3.89	3.80	3.75	2.79	3.98	4.28	4.01	2.43	3.13	3.17	3.02
LYMPH.LEUK.	4.31	3.46	3.56	2.90	2.99	2.55	4.02	2.26	3.25	3.45	2.60
MYEL.LEUK.	2.92	2.64	3.24	2.90	3.10	3.76	3.76	2.51	2.64	2.41	2.47
MALIGNANT T (SKIN)	215.67	248.15	263.73	204.15	286.33	239.58	256.72	279.37	274.93	214.98	270.00
TOTAL	**365.94**	**467.43**	**512.71**	**435.36**	**324.58**	**583.80**	**482.88**	**510.06**	**603.05**	**555.80**	**445.79**

Prepared by authors based on CIFC date. Volume IC (Curado et al, 2007)

With the exception of thyroid cancer, all of the types of tumors were more frequent in males than in females. The highest male to female ratio of the adjusted rates is found in cancer of the bucal cavity and pharynx, esophagus, larynx, lung and bladder. Most are of these tumors are related to alcohol and tobacco, which likewise indicated different patterns of use between the two genders. In any of these tumor sites the male to female ratio also varied considerably from one registry to another. This is the case of esophageal cancer (sex ratio of 16 in Albacete v. 7 in Navarre), laryngeal cancer (sex ratio of 23 in the Canary Islands and 67 in Granada) or lung cancer (sex ratio of 7 in the Canary Islands and 27 in Granada).

The incidence data taken from Spain's population-based registries which have been operating the longest (Granada, Murcia, Navarre, Tarragona and Zaragoza) recorded in Volumes VI, VII, VIII and IX of the CIFC publication (Parkin et al., 2005) provide an idea of the trend in the incidence rates over the last few years. In all of the registries, for both genders, a progressive rise is noted in the incidence over the course of time, although a tendency toward stabilizing is shown in the last period. Solely the stomach tumors clearly decline both in males and females.

1.3.2. Mortality

Table 4 shows the number of deaths recorded in Spain. In 2006, cancer caused 98,046 deaths [61,184 deaths in males and 36,862 deaths in females]. In terms of absolute mortality, the most important tumors for males were lung cancer (16,859 deaths), colorectal cancer (7,703 deaths) and prostate cancer (5,409 deaths); the most important tumors for females having been breast cancer (5,939 deaths), colorectal cancer (5,631 deaths) and lung cancer (2,624 deaths). In Europe, it is estimated that cancer was responsible for more than 1.2 million deaths in Europe in 2006 (ECO-OEC, 2009). As in Spain, the three tumors causing most deaths were – in this order – lung cancer, colorectal cancer and breast cancer. Figure 1 shows the estimated incidence and mortality rates in the different EU countries for the most important types of cancer in 2006.

Fig.1 Estimated incidence and mortality rates in different EU countries for 2006. Rates adjusted to the European population (cases/100,000 individuals).

LUNG

Males

Females

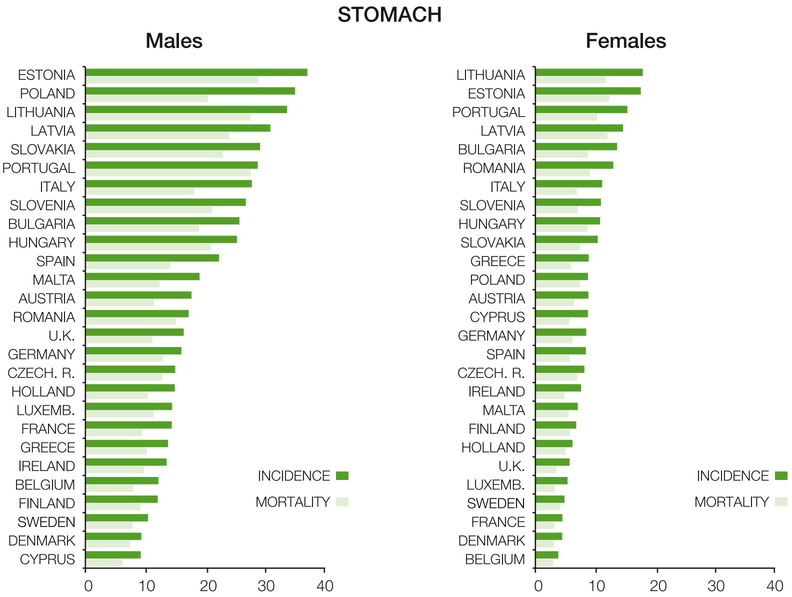
BLADDER

Males

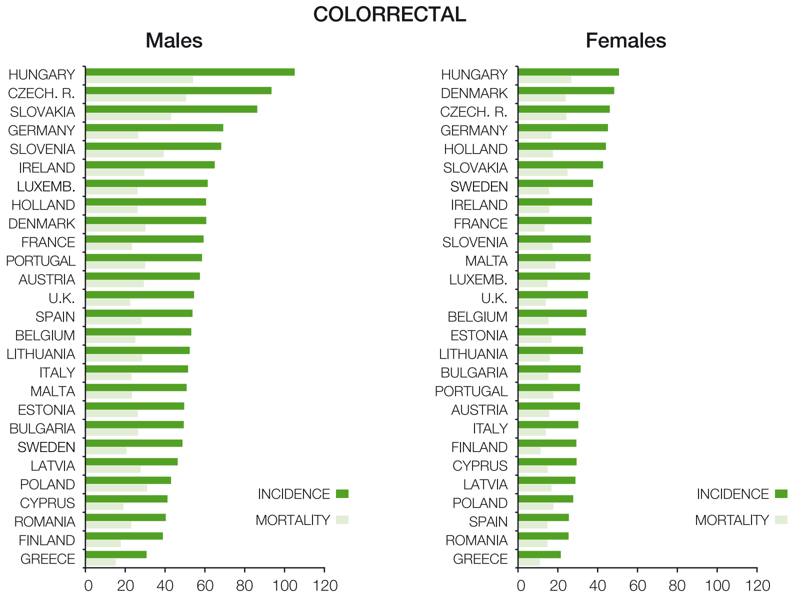
Females

Prepared by the Ministry of Health and Social Policy based on the data from the European Cancer Observatory.Observatoire Européen du Cancer International Agency for Research on Cancer, Lyon, 2009 (http://eu-cancer.iarc.fr)

Fig.1 **Estimated incidence and mortality rates in different EU countries for 2006. Rates adjusted to the European population (cases/100,000 individuals).**



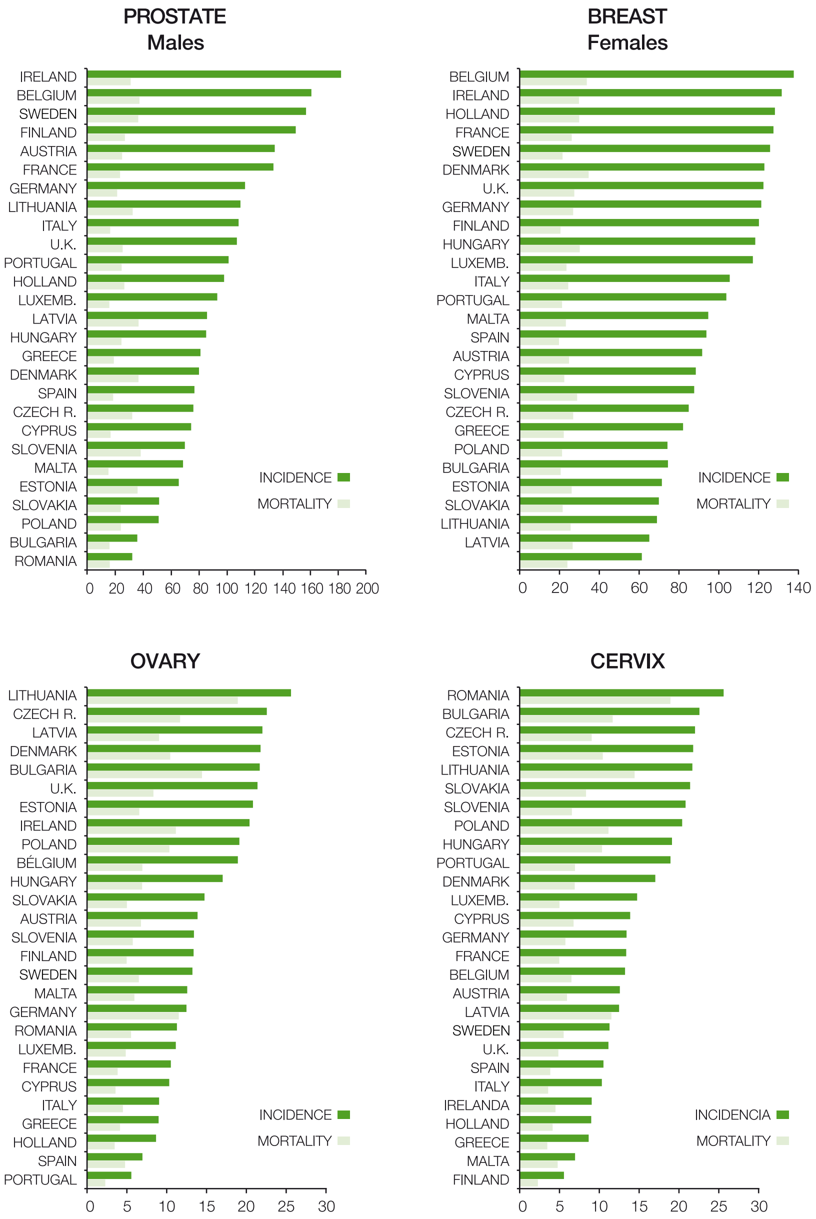
STOMACH



COLORRECTAL

Prepared by the Ministry of Health and Social Policy based on the data from the European Cancer Observatory.Observatoire Européen du Cancer International Agency for Research on Cancer, Lyon, 2009 (http://eu-cancer.iarc.fr)

Fig.1 Estimated incidence and mortality rates in different EU countries for 2006. Rates adjusted to the European population (cases/100,000 individuals).



Prepared by the Ministry of Health and Social Policy based on the data from the European Cancer Observatory.Observatoire Européen du Cancer International Agency for Research on Cancer, Lyon, 2009 (http://eu-cancer.iarc.fr)

Table 4. Number of deaths registered for the 15 most frequent malignant tumors, age and gender, for all of Spain (2006).

	All ages		Age 1-19		Age 20-39	
Male						
1º	Lung	16859	Leukemias	68	Brain	99
2º	Colorectal	7585	Brain	30	Lung	91
3º	Prostate	5409	Bone	21	Leukemias	79
4º	Bladder	3732	NHL	12	Poorly –defined tumors	55
5º	Stomach	3533	Connective Tissue	11	Bone	46
6º	Poorly-defined tumors	3366	Poorly-defined tumors	7	NHL	45
7º	Pancreas	2535	Lung	2	Stomach	45
8º	Primary liver	1796	Bladder	2	Colorrectal	43
9º	Leukemias	1782	Kidney	2	Melanoma	29
10º	Oral & Pharynx	1730	Others CNS	2	Oral & Pharynx	24
11º	Esophagus	1494	Testicle	2	Pancreas	22
12º	Larynx	1479	Hodgkin	1	Connective Tissue	21
13º	Brain	1387	Larynx	1	Primary liver	21
14º	Kidney	1262	Breast	0	Testicle	18
15º	NHL	1210	Colorrectal	0	Hodgkin	17
	Age 40-59		Age 60-79		Age 80 and older	
1º	Lung	3425	Lung	10213	Lung	3128
2º	Colorectal	920	Colorectal	4209	Prostate	2944
3º	Bucal cav. & Pharynx	646	Prostate	2339	Colorectal	2413
4º	Poorly-defined tumors	566	Bladder	1989	Bladder	1423
5º	Stomach	541	Stomach	1945	Stomach	1002
6º	Pancreas	522	Poorly-defined tumors	1760	Poorly-defined tumors	977
7º	Brain	411	Pancreas	1452	Pancreas	539
8º	Esophagus	402	Primary liver	1089	Leukemias	523
9º	Larynx	377	Leukemias	893	Kidney	339
10º	Primary liver	354	Esophagus	854	Primary liver	331
11º	Bladder	312	Larynx	848	NHL	283
12º	Kidney	229	Oral & Pharynx	843	Larynx	248
13º	NHL	224	Brain	694	Esophagus	230
14º	Leukemias	216	Kidney	683	Myeloma	228
15º	Prostate	126	NHL	646	Bucal cav. & Pharynx	217

Table 4. Number of deaths registered for the 15 most frequent malignant tumors, age and gender, for all of Spain (2006).

	All ages		Age 1-19		Age 20-39	
	Female					
1º	Breast	5939	Leukemias	35	Breast	200
2º	Colorrectal	5490	Brain	19	Brain	73
3º	Poorly-defined tumors	2721	Bone	14	Leukemias	59
4º	Lung	2624	NHL	7	Uterus	55
5º	Pancreas	2315	Connective Tissue	3	Colorrectal	52
6º	Stomach	2170	Ovary	3	Lung	42
7º	Uterus	1931	Poorly-defined tumors	2	Stomach	42
8º	Ovary	1908	Hodgkin	2	Poorly-defined tumors	41
9º	Leukemias	1353	Melanoma	2	Ovary	39
10º	Brain	1120	Stomach	1	Melanoma	29
11º	NHL	1092	Oral & Pharynx	1	NHL	26
12º	Gallbladder	805	Nasal cavity	1	Bones	21
13º	Bladder	781	Lung	0	Hodgkin	16
14º	Myeloma	762	Bladder	0	Connective Tissue	15
15º	Kidney	711	Kidney	0	Pancreas	13
	Age 40-59		Age 60-79		Age 80 and older	
1º	Breast	1504	Breast	2478	Colorrectal	2568
2º	Lung	794	Colorrectal	2329	Breast	1757
3º	Colorrectal	541	Pancreas	1205	Poorly-defined tumors	1252
4º	Ovary	439	Lung	1172	Stomach	996
5º	Uterus	374	Poorly-defined tumors	1153	Pancreas	845
6º	Poorly-defined tumors	273	Ovary	944	Lung	616
7º	Pancreas	252	Uterus	924	Uterus	578
8º	Stomach	245	Stomach	886	Leukemias	549
9º	Brain	238	Leukemias	597	Ovary	483
10º	NHL	113	Brain	578	Bladder	460
11º	Leukemias	112	NHL	543	NHL	403
12º	Melanoma	104	Myeloma	404	Gallbladder	365
13º	Kidney	90	Gallbladder	390	Myeloma	307
14º	Oral & Pharynx	88	Primary liver	367	Kidney	267
15º	Esophagus	56	Kidney	345	Primary liver	226

Source: Environmental Epidemiology and Cancer Department. National Center of Epidemiology, 2009.

Tables 5 and **6** show the cancer mortality rates adjusted to the European population for Spain as a whole and for the Autonomous Communities for the 2002-2006 five-year period.

The highest mortality rates in males were for lung, colorectal, prostate, stomach and bladder cancer; and in females, in breast, colorectal, lung, stomach and pancreatic tumors. One must take into account, however, that the analysis by Autonomous Communities may overshadow the mortality patterns at the provincial level (Lopez-Abente et al., 2001).

Regarding the mortality rate caused in males by five of the most important tumors (lung, colorectal, prostate, bladder and stomach), as well as by all tumors as a whole, Spain was ranked in an intermediate position among the European countries in 2006. To the contrary, in the females, the overall cancer mortality rate for the same period was the lowest in Europe. It is interesting to note that the mortality rate for breast cancer (most frequent tumor in females) was also the lowest in the EU27.

Worthy of special note is the fact that Spain is ranked high in the European bladder tumor mortality rate ranking, although, as has been the case in the rest of our neighboring countries, the bladder tumor mortality rates have declined over the past few years, (Ferlay et al., 2008). The trend observed has to do in part with the drop in the prevalence of tobacco smoking in Spanish males, as well as a decreased occupational exposure to certain cancer-causing substances.

Within Spain, the highest cancer-related mortality rate in males for the 2002-2006 period was found in Asturias, with adjusted rates of over 270 cases/100,000/year, followed by the Basque Country and Cantabria. The lowest mortality rate was recorded in Castile-La Mancha, with rates of around 206 cases/100,000 individuals/year. By tumor sites, the oral cavity and pharyngeal cancer rates are surprisingly high in the Canary Islands, Asturias, Cantabria, Basque Country, Galicia and Melilla; esophageal cancer in Asturias, Basque Country, Canary Islands, Galicia and Rioja; stomach cancer in Castile and Leon and Galicia; colorectal cancer in Asturias, Galicia and Basque Country; liver and pancreatic cancer in Ceuta; laryngeal cancer in Cantabria; lung cancer in Extremadura, Asturias, Andalusia, Balearic Islands, Ceuta and Melilla; prostate cancer in Galicia; bladder in Andalusia, Balearic Islands and in the Autonomous Community of Valencia and Rioja, central nervous system tumors in Navarre and Cantabria; and non-Hodgkin lymphomas in Canary Islands.

In females, the highest overall adjusted cancer mortality rate was that of the Canary Islands, with 113 / 100,000 individuals / year, whilst the lowest rate was for Castile-La Mancha (Table 6). By tumor sites, special note may be made of the higher stomach cancer mortality rate in Castile and Leon and Galicia; liver cancer in Melilla, Andalusia, Balearic Islands and Canary Islands; pancreatic cancer in Ceuta, Cantabria and Navarre; lung cancer in Balearic Islands and Canary Islands; breast cancer in Andalusia, Aragon, Autonomous Community of Valencia and Melilla; uterine cancer in Ceuta and Melilla; ovarian cancer in Rioja; bladder cancer in Rioja and Ceuta; and cervical cancer clearly higher in Ceuta.

Table 5. Cancer mortality rates adjusted to the European population in Autonomous Communities for the five-year period of 2002-2006 (males).

TUMOR	Andalusia	Aragon	Asturias	Balearic Islands	Canary Islands	Cantabria	C. La M.	C & L	Catalonia	Val	Extrem.	Galicia	Madrid	Murcia	Navarre	B.C.	Rioja	Ceuta	Melilla	Spain
ORAL & PHARYNX	8.05	5,82	11,73	6.97	12.61	10.05	5.94	7.37	7.60	7.29	6.13	9.68	6.05	6.86	6.30	11.13	5.74	5.80	10.52	7.87
ESOPHAGUS	5.61	5.45	9.73	5.85	8.26	7.61	3.81	6.52	6.95	6.38	4.30	8.69	5.83	4.39	6.93	9.64	8.00	4.56	4.40	6.55
STOMACH	12.52	13.56	14.05	8.07	8.81	14.03	14.78	18.65	13.39	12.71	16.02	16.14	13.06	11.55	14.86	15.50	14.80	14.10	11.85	13.78
S. INTESTINE	0.33	0.17	0.44	0.33	0.46	0.40	0.47	0.44	0.27	0.23	0.20	0.32	0.26	0.27	0.05	0.38	0.34	0.00	0.00	0.31
COLORECTAL	27.22	26.68	32.61	27.76	23.29	27.58	22.36	29.96	29.43	28.26	27.08	30.24	27.56	26.67	26.01	32.08	29.67	21.25	13.90	28.17
LIVER	12,72	9.02	12.13	12.56	11.90	10.39	8.54	10,39	11.80	10.20	11.06	11.65	12.63	9.38	9.07	10.70	11.33	14.82	8.48	11.31
GALLBLADDER	1.93	1.74	1.36	1.14	1.49	1.57	1.79	2.04	2.11	1.78	1.37	1.19	1.68	1.45	2.47	1.74	1.94	1.98	1.46	1.76
PANCREAS	8.23	9.99	11.13	9.97	10.46	11.12	8.44	10.48	9.99	9.07	9.80	10.73	9.35	9.28	10.83	10.67	9.66	15.94	9.47	9.66
PERITONEUM	0.33	0.36	0.45	0.45	0.67	0.63	0.28	0.37	0.48	0.48	0.42	0.44	0.41	0.60	0.31	0.49	0.35	0.74	0.00	0.43
UNSPEC. DIGESTIVE	1.08	1.15	0.96	0.63	1.33	0.92	0.96	1.54	0.58	0.85	0,61	1.01	0.86	1.20	1.28	1.15	1.13	1.67	0,66	0.98
NASAL CAVITY	0.17	0.14	0.69	0.05	0.19	0.42	0.10	0.28	0.22	0.22	0.23	0.65	0.23	0.19	0.38	0.32	0.36	0.00	0.00	0.26
LARYNX	8.02	5,96	7.78	4.98	7.03	9.11	5.33	6,89	5,49	5,78	7,65	7.42	5.58	6.40	7.65	7.69	8.21	7.00	8.31	6.58
LUNG	72.36	62.50	77.84	71.14	58.16	68.68	60.20	57.07	68.22	69.89	84.18	63.93	62.79	66.81	61.41	63.74	55.62	72.47	83.74	66.51
PLEURA	0.52	0.64	0.52	0.35	0.29	1.30	0.22	0.48	0.84	0.64	0.30	0.61	0.66	0.64	0.80	1.02	0.61	0.74	0.00	0.62
OTHER THORACIC	0.37	0.54	0.37	0.20	0.58	0.43	0.45	1.16	0.41	0.50	0.60	0.57	0.77	0.79	0.46	0.40	0.37	0.64	0.95	0.54
BONES	0.74	0.57	0.63	0.63	1.29	0.98	0.61	0.92	0.65	0.52	0.86	0.61	0.72	0.69	0.28	0.74	0.86	0.00	0.00	0.71
CONNECTIVE T.	0.99	0.95	0.87	0.83	0.91	0.75	1.03	1.12	1.01	0.83	0.58	1.10	0.97	0.66	1.02	1.03	0.53	0.58	1.19	0.96
MELANOMA	1.43	1.54	1.53	1.94	1.51	1.22	1.80	1.65	1.86	1.95	1.36	1.39	2.00	1.81	2.52	2.02	2.14	1.23	2.61	1.74
SKIN	1.25	1.02	1.32	1.36	1.33	0.97	1.10	1.29	0.72	0.71	1.45	0.80	0.96	1.34	0.98	0.89	1.05	0,88	0.00	1.01
BREAST	0.25	0.26	0.28	0.18	0.32	0.41	0.25	0.26	0.24	0.22	0.21	0.25	0.29	0.24	0.09	0.24	0.23	0.00	0.00	0.25
PROSTATE	18.71	20.96	21.83	21.21	21.10	20.89	18.64	20.56	18.47	20.82	18.87	23.00	17.69	19.91	19.01	20.52	21.78	14.21	19.12	19.82
TESTICLE	0.22	0.15	0.18	0.07	0.13	0.19	0.12	0.21	0.11	0.24	0.37	0.24	0.06	0.38	0,18	0.24	0.11	0.60	0.00	0.18
OTHER MALE GENIT.	0,56	0.43	0.25	0.40	0.68	0.33	0.28	0.35	0.38	0.53	0.48	0.39	0.39	0.39	0.39	0.43	0.23	1.19	0.00	0.43

Table 5. Cancer mortality rates adjusted to the European population in Autonomous Communities for the five-year period of 2002-2006 (males).

BLADDER	15.01	12.83	13.49	14.79	13.56	13.36	11.72	11.93	13.69	14.99	12.55	11.87	12.99	13.58	12.80	13.78	14.89	9.75	9.85	13.5
KIDNEY	4.45	4.79	6.24	4.60	3.39	5.92	3.79	5.40	4.92	4.47	4.43	4.88	4.48	3.60	5.25	6.48	5.19	4.90	6.43	4.74
EYE	0.10	0.07	0.10	0.05	0.12	0.12	0.15	0.15	0.15	0.13	0.09	0.11	0.10	0.18	0.23	0.09	0.15	0.00	0.00	0.12
CNS	5.39	6.54	6.34	5.05	6.45	7.58	5.79	6.17	5.65	5.73	6.19	6.51	5.86	5.05	8.58	6.36	6.98	3.06	3.91	5.92
THYROID	0.31	0.38	0.47	0.32	0.48	0.11	0.35	0.30	0.29	0.45	0.19	0.50	0.39	0.27	0.26	0.42	0.27	0.00	0.00	0.36
OTHER ENDOCRINE	0.38	0.72	0.46	0.89	0.27	0.32	0.57	0.43	0.40	0.32	0.41	0.46	0.43	0.31	0.52	0.29	0.00	0.00	0.00	0.41
POORLY-DEF. TUMORS	17.68	13.83	17.52	11.74	22.38	20.98	12.16	14.52	15.52	16.11	16.65	18.05	17.29	16.27	11.55	20.12	14.51	17.69	14.24	16,58
NHL	5.05	4.41	5.54	5.31	7.45	3.80	3.83	4.35	5.48	4.41	3.69	6.16	4.30	4.51	4.27	5.28	5.42	3.88	4.51	4.97
HODGKIN	0.59	0.51	0.57	0.43	0.55	0.39	0.51	0.51	0.57	0.47	0.58	0.50	0.54	0.29	0.44	0.40	0.27	1.23	0.00	0.52
MYELOMA	2.93	3.40	2.87	2.92	2.99	2.04	2.91	2.74	3.09	2.94	2.71	2.71	2.96	2.88	1.90	2.71	2.97	2.39	4.02	2.90
LLC	1.45	1.10	2.10	1.49	0.85	1.06	1.48	1.38	1.55	1.43	1.62	1.04	1.23	1.02	1.01	1.22	1.32	0.59	0.95	1.36
LEUKEMIA (TOTAL)	6.89	6.94	7.37	6.82	5.53	6.20	6.46	6.48	7.56	6.72	7.21	5.80	6.46	5.87	5.75	5.76	5.87	10.17	4.38	6.67
TOTAL	**242.87**	**224.64**	**270.42**	**230.51**	**236.41**	**251.38**	**205.95**	**233.34**	**239.14**	**237.19**	**249.36**	**248.96**	**227.05**	**225.40**	**225.19**	**255.12**	**231.70**	**233.47**	**224.00**	**237.57**

Source: Environmental Epidemiology and Cancer Division. National Center of Epidemiology, 2009

Table 6: Cancer mortality rates adjusted to the European population in Autonomous Communities for the five-year period 2002-2006 (females).

TUMOR	Andalusia	Aragon	Asturias	Balearic Islands	Canary Islands	Cantabria	C. La M.	C & L	Catalonia	Val	Extrem.	Galicia	Madrid	Murcia	Navarre	B.C.	Rioja	Ceuta	Melilla	Spain
ORAL AND PHARYNX	1.28	1.22	1.34	1.57	1.63	2.10	1.15	1.06	1.24	1.52	1.05	1.37	1.18	1.27	0.96	1.56	0.99	1.05	0.52	1.30
ESOPHAGUS	0.73	0.62	0.91	1.01	1.03	0.49	0.31	0.43	0.77	0.59	0.70	0.77	0.74	0.57	0.53	1.09	0.39	0.89	0.98	0.71
STOMACH	5.11	6.12	6.20	4.16	4.03	6.10	6.44	8.20	5.48	5.95	6.07	7.73	5.62	5.66	5.83	5.86	7.02	4.95	6.20	5.96
S. INTESTINE	0.18	0.19	0.45	0.11	0.19	0.32	0.22	0.13	0.19	0.15	0.12	0.14	0.17	0.16	0.17	0.21	0.39	0.00	0.00	0.18
COLORECTAL	14.88	14.61	14.11	14.86	13.64	12.88	13.21	15.47	15.19	16.24	15.12	15.57	14.72	15.45	13.58	13.97	12.66	9.48	15.26	14.91
LIVER	4.74	3.60	3.52	4.13	4.27	2.73	3.65	3.06	4.14	3.90	3.06	3.63	4.34	3.26	2.83	3.37	3.76	3.79	6.43	3.91
GALLBLADDER	2.65	1.98	1.12	1.81	2.37	1.93	2.57	2.11	1.94	2.23	2.20	1.77	1.83	2.03	3.15	2.25	2.72	3.29	1.50	2.13
PANCREAS	5.03	6.20	6.54	5.94	6.55	7.30	5.51	5.62	6.21	5.87	6.10	6.38	5.79	5.70	7.26	6.49	6.64	8.16	3.41	5.94
PERITONEUM	0.36	0.21	0.25	0.38	0.32	0.99	0.26	0.33	0.44	0.30	0.41	0.41	0.36	0.47	0.35	0.34	0.26	0.00	0.00	0.36
UNSPEC. DIGESTIVE	0.56	0.54	0,32	0,41	0,64	0,56	0,61	0.74	0.43	0.56	0.74	0.54	0.49	0.74	0.85	0.50	0.40	0.00	0.41	0.54
NASAL CAVITY	0.06	0.04	0.05	0.11	0.15	0.22	0.10	0.12	0.08	0.06	0.03	0.08	0.08	0.04	0.14	0.08	0.06	0.00	0.00	0.08
LARYNX	0.23	0.23	0.14	0.38	0.42	0.34	0.19	0.17	0.26	0.24	0.17	0.21	0.26	0.22	0.14	0.33	0.19	0.00	1.53	0.24
LUNG	6.38	7.90	8.52	10.85	10.69	8.23	5.86	7.15	8.53	8.24	5.60	7.91	9.02	6.11	9.03	9.33	6.67	9.69	9.75	7.97
PLEURA	0.23	0.09	0.15	0.23	0.15	0.11	0.07	0.17	0.23	0.19	0.11	0.16	0.13	0.21	0.70	0.30	0.06	0.00	0.35	0.19
OTHER THORACIC	0.10	0.12	0.15	0.12	0.25	0.07	0.15	0.18	0.15	0.15	0.19	0.17	0.19	0.09	0.17	0.15	0.08	0.00	0.00	0.15
BONES	0.40	0.45	0.37	0.17	0.37	0.57	0.45	0.51	0.32	0.50	0.58	0.38	0.34	0.71	0.17	0.32	0.46	1.05	0.00	0.40
CONNECTIVE T.	0.72	0.81	0.98	0.48	0.61	0.62	0.91	0.67	0.72	0.71	0.40	0.99	0.67	0.57	0.99	0.69	0.47	0.97	0.00	0.73
MELANOMA	1.01	1.41	1.58	1.02	0.88	1.40	1.02	1.06	1.19	1.28	0.92	1.11	1.18	1.50	1.38	1.34	0.75	0.56	1.41	1.17
SKIN	0.52	0.32	0.54	0.67	0.47	0.29	0.68	0.51	0.30	0.31	0.69	0.51	0.46	0.71	0.23	0.37	0.40	0.41	0.00	0.45
BREAST	20.48	20.45	20.11	19.72	19.54	15.84	17.42	18.78	19.95	20.32	18.69	17.68	18.63	19.76	16.86	17.74	16.27	15.12	22.74	19.24
CORPUS UTERY	6.43	5.35	6.73	7.06	6.83	6.09	5.52	5.41	4.97	6.07	5.51	6.33	4.93	6.53	4.41	5.47	5.99	9.45	8.00	5.74
CERVIX	2.29	1.52	1.92	3.78	3.35	2.17	1.74	1.89	1.67	2.28	1.71	2.27	1.88	1.69	1.43	1.75	1.33	5.40	3.77	2.04
PLACENTA	0.01	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.10	0.00	0.00	0.00	0.00	0.01
OVARY	6.12	6.39	6.68	6.87	6.03	5.79	6.28	6.32	5.97	6.63	6.15	6.96	5.80	6.09	6.96	5.96	8.12	4.63	6.34	6.24

Table 6: Cancer mortality rates adjusted to the European population in Autonomous Communities for the five-year period 2002-2006 (females).

OTHER FEM. GENIT.	0.80	0.79	0.78	1.01	0.68	0.71	0.81	0.90	0.71	0.73	0.99	0.76	0.70	0.58	0.64	0.77	0.80	0.73	0.35	0.76
BLADDER	1.77	1.96	1.94	1.60	1.77	1.92	1.66	1.68	1.76	1.84	1.09	1.64	1.64	1.64	1.73	1.95	2.21	2.03	0.78	1.74
KIDNEY	1.84	1.92	2.27	1.66	0.90	1.90	1.34	2.04	1.69	1.43	2.19	1.58	1.58	1.26	2.61	2.10	2.14	2.19	0.00	1.72
EYE	1.84	0.13	0.06	0.12	0.06	0.17	0.08	0.09	0.08	0.08	0.05	0.05	0.08	0.08	0.06	0.07	0.00	0.00	0.00	0.08
CNS	3.80	4.20	4.35	3.71	4.31	5.13	3.44	3.93	3.90	3.69	3.43	3.74	3.57	4.00	5.39	4.61	5.30	3.07	2.73	3.90
THYROID	0.39	0.35	1.02	0.25	0.77	0.22	0.56	0.37	0.46	0.34	0.46	0.64	0.42	0.44	0.65	0.50	0.43	0.76	0.95	0.47
OTHER ENDOCRINE	0.30	0.28	0.36	0.14	0.30	0.38	0.36	0.21	0.36	0.27	0.28	0.27	0.28	0.35	0.12	0.21	0.14	0.67	0.51	0.29
POORLY-DEF. TUMORS	9.04	7.14	7.91	7.36	11.93	9.27	6.44	7.82	7.16	8.56	10.12	8.69	8.28	8.92	5.37	8.83	7.90	11.61	9.45	8.32
NHL	3.32	3.49	3.27	3.09	4.93	2.65	2.70	2.87	3.65	2.81	2.72	3.87	2.70	2.79	2.31	2.99	2.51	3.45	3.02	3.21
HODGKIN	0.36	0.33	0.42	0.64	0.41	0.50	0.28	0.30	0.29	0.32	0.29	0.23	0.27	0.23	0.57	0.22	0.00	0.41	0.00	0.31
MYELOMA	2.17	1.87	2.85	2.02	2.64	1.80	2.26	1.88	2.09	2.32	2.32	1.98	1.90	2.39	1.71	1.89	1.77	1.02	0.00	2.11
LLC	0.73	0,69	0.98	0.70	0.38	0.44	0.61	0.55	0.69	0.59	0.63	0.44	0.61	0.66	0.48	0.58	0.44	0.00	0.00	0.63
LEUKEMIA (TOTAL)	4.00	3.74	4.48	3.52	3.47	3.12	3.71	3.81	4.34	3.61	4.07	3.61	3.72	3.93	2.77	3.14	2.75	1.59	1.62	3.82
TOTAL	**106.18**	**105.30**	**110.60**	**107.33**	**113.29**	**102.83**	**96.32**	**104.19**	**105.36**	**108.16**	**102.77**	**107.90**	**102.20**	**104.65**	**100.87**	**105.16**	**100.7**	**101.0**	**105.3**	**105.41**

Source: Environmental Epidemiology and Cancer Division. National Center of Epidemiology, 2009

The cancer mortality rate in Spanish males underwent a statistically-significant (**Table 7**) moderate decline from 1.3% annually as of 1997, this being a drop noted, to a greater or lesser degree, in most of the tumors. Solely the mortality rate due to colon and rectal cancers, melanoma and leukemias show stabilization for this same period. Pancreatic cancer is the only tumor in males for which the mortality rate continues to be found to be rising. It is interesting to note the decline in lung cancer mortality in males.

In females, the cancer mortality rate dropped significantly as of 1997 by an average of 1% per year (**Table 7**). This drop is apparent for most malignant tumors, the drop being prominent due to major degree thereof in the breast cancer mortality rate (2% annually as of 1993) and the marked drop in stomach, gallbladder and bone tumors, showing declines of over 3% annually . The most outstanding item of data is that, unlike that which has been previously mentioned for males, the lung cancer mortality rate rose significantly in Spanish women (3.12% annual). The pancreatic cancer mortality rate also rose (1.31% annually).

Table 7. Cancer mortality rates adjusted to the European population percentage of change Annuals (% Δ) over the last 10 years, 1997-2006.

TUMOR	Hombres			Mujeres		
	% Δ	IC 95%		% Δ	IC 95%	
ORAL AND PHARYNX	-2.83	-3.32	-2.33	0.38	-0.72	1.49
ESOPHAGUS	-2.07	-2.61	-1.53	-1.69	-3.06	-0.31
STOMACH	-3.57	-3.92	-3.23	-3.84	-4.28	3.41
S. INTESTINE	1.98	-0.55	4.58	1.00	-1.74	3.82
COLOR RECTAL	0.28	0.01	0.54	-1.20	-1.49	0.91
LIVER	-1.71	-2.11	-1.31	-2.36	-2.90	-1.82
GALLBLADDER	-2.58	-3.54	-1.60	-4.33	-5.02	-3.63
PANCREAS	0.81	0.35	1.27	1.31	0.82	1.81
PERITONEUM	-3.61	-5.61	-1.58	-2.99	-4.82	-1.12
UNSPEC. DIGESTIVE	-1.76	-3.09	-0.42	-2.19	-3.58	-0.78
NASAL CAVITY	-2.09	-4.70	0.59	1.79	-5.77	2.35
LARYNX	-4.32	-4.82	-3.81	0.83	-1.89	3.63
LUNG	-0.91	-1.07	-0.74	3.12	2.63	2.61
PLEURA	0.04	-1.69	1.80	-1.13	-3.81	1.62
OTHER THORACIC	-3.13	-4.91	-1.32	1.39	-1.96	4.86
BONES	-3.27	-4.86	-1.65	-3.41	-5.28	-1.50
CONNECTIVE T.	-0.66	-2.08	0.79	-1.37	-2.83	0.11
MELANOMA	0.14	-0.94	1.23	0.62	-0.55	1.81
SKIN	-2.81	-4.10	-1.50	-4.41	-5.80	-3.01
BREAST	-3.31	-5.87	-0.69	-1.84	-2.12	-1.56
CORPUS UTERY	-	-	-	-1.51	-2.01	-1.01
CERVIX	-	-	-	-1.65	-2.55	-0.75

Table 7. Cancer mortality rates adjusted to the European population percentage of change Annuals (% Δ) over the last 10 years, 1997-2006.

OVARY	-	-	-	0.19	-0.32	0.70
OTHER FEM. GENIT.	-	-	-	-6.32	-7.34	-5.12
PROSTATE	-3.41	-3.69	-3.13	-	-	-
TESTICLE	-1.00	-4.22	2.34	-	-	-
OTHER MALE GENIT	-1.09	-3.13	0.99	-	-	-
BLADDER	-0.36	-0.73	0.01	-0,74	-1.54	0.06
KIDNEY	-0.65	-1.28	-0.01	0.27	-0.62	1.18
EYE	-2.28	-6.06	1.65	-2.67	-6.60	1.42
CNS	0.23	-0.37	0.83	0.83	0.16	1.51
THYROID	-1.63	-3.83	0.62	-3.27	-4.82	-1.70
OTHER ENDOCRINE	2.90	0.44	5.42	3.20	0.49	5.97
POORLY-DEFINED TUMORS	-0.66	-1.00	-0.33	-0.74	-1.13	0.34
NHL	-1.27	-1.88	-0.66	-1.19	1.83	-0.55
HODGKIN	-4.23	-6.00	-2.43	-2.47	-4.51	-0.37
MYELOMA	-1.30	-2.07	-0.52	-1.01	-1.78	-0.24
LLC	0.01	-1.15	1.18	0.32	-1.04	1.70
LEUKEMIA (TOTAL)	-0.45	-0.99	0.08	-0.91	-1.51	-0.31
TOTAL	**-1.28**	**-1.37**	**-1.19**	**-1.06**	**-1.18**	**-0.95**

Source: Environmental Epidemiology and Cancer Division. National Epidemiology Center, 2009.

1.3.3. Comments on some specific tumors

1.3.3.1. Tobacco-Related Cancers

Lung Cancer

Lung cancer is the most important tumor with regard to mortality in the Western world. In 2002, 1.35 million people were diagnosed with lung cancer, 1.18 million having died due to this tumor. In Spain, lung cancer is one of the most frequent tumors in males and was the leading cause of death in 2006, the year in which it was responsible for 16,859 deaths, totaling 27% of all deaths caused by malignant tumors. In females, lung cancer was the third most lethal tumor, having caused 2,624 deaths that same year.

There are many histological types of lung cancer. The most important are the squamous cell carcinomas, the adenocarcinomas and the small cell tumors. From the clinical standpoint however, two main types are basically recognized: small cell carcinoma, sensitive to cytotoxic agents, and non-small cell tumors, the main treatment for which is surgery if no spread is involved. Despite the advancements made in diagnosis and treatment, lung cancer continues to be highly lethal, around 11% of the patients managing to survive five years following diagnosis (Sant el al., 2009). Therefore, the mortality rate continues to be a good indicator for the study of the frequency of this tumor.

Lung cancer shows a marked geographical and time-based variability. This fact reflects the distribution of its risk factors, mainly tobacco smoking, responsible for 80%-90% of the cases.

In the 1970's, Spain was ranked as one of the lowest regarding the frequency of this tumor in males among the European countries, whilst higher rates were being recorded in the Northern and Central European countries. However, the effectiveness of the fight against the smoking habit in these countries has meant a decline in the incidence and mortality rates for this cancer, whilst these rates have continued rising in the rest of the countries.

Lung cancer additionally shows a different pattern between males and females. Both the incidence and mortality rates are much higher in males, reflected both the fact that Spanish women acquire the smoking habit at a later age as well as their being exposed less to toxic agents in the working environment. However, the ratio between the incidence of lung cancer in males and females has dropped significantly in all of Spain's registries in ten years' time.

In the 1988-1992 period, the percentage of males who developed lung cancer was 15 times higher than the percentage of females. Ten years later, the ratio was ten to one (10:1). The same is true for the mortality rate, the male/female ratio having been 12 in 1996 and 7.5 in 2006.

This data reflects males gradually quitting smoking and females starting smoking. Within the 1987-2003 period, the number of female smokers rose by 7.9% (Ministry of Health, 2006). The impact of tobacco is similarly found in other related cancers, such as laryngeal cancer. In other European countries, the male/female ratio is much lower than in Spain, but a downward trend is found to exist in all of these ratios.

As previously mentioned herein, lung cancer has a very bad prognosis, with a five-year age-adjusted survival rate in the EU of approximately 12% (Sant el al., 2009). This survival rate varies considerably among the EU countries. The highest rate is found in Holland (14.3%) and the lowest in Denmark (7.9%), thus suggesting that early diagnosis at stages in which it is possible to eliminate the tumor by surgery is highly important (Sant et al., 2009). In Spain, the lung cancer survival rate for patients diagnosed within the 1995-1999 period was 11% (Sant et al., 2009).

Lung cancer continues to be a public health problem, and the prevalence of tobacco smoking continues to be the most important risk factor for predicting cases of lung cancer in the future. Although the prevalence of smokers has decreased throughout Europe, there is still a very high percentage of the European population who are currently smoking (Fernández et al., 2003). In Spain, as shown in the latest National Health Survey

(2006), 31.5% of the males and 21.5% of the females over 15 years of age are smokers (Ministry of Health, 2006). This same Health Survey in 1987 showed 55% male smokers and 23% female smokers. The trend observed among the females both in Spain and in Europe is cause for concern (Agudo et al., 2000), revealing the need for an effective fight against smoking targeting specifically the female population.

Other risk factors which have a bearing on the total percentage of deaths, although to a much lesser degrees, are occupational exposures to different substances such as arsenic, asbestos, polycyclic aromatic hydrocarbons (Blot and Fraumeni, Jr., 1976), ionizing radiation, air pollution and eating less fresh vegetables and fruit, probably reflecting the protective effect of the antioxidant agents contained in these foods (Blot, 1997).

Bladder Cancer

Spain's prominently high ranking within the European environment regarding incidence and mortality makes it advisable to give this tumor specific attention. The incidence rate of bladder cancer in males is one of the highest in the EU, being outranked solely by Belgium and Hungary.

In Spain, it is estimated at a total of 11,164 cases of bladder cancer were diagnosed in 2006, a total of 3,732 deaths having been recorded. On the other hand, a total of 1,481 cases were diagnosed in females, a total of 808 deaths having been caused by bladder cancer.

In males, very high adjusted incidence rates were found, being of 42.5 cases/100,000 in comparison to other European countries and to Spanish females (4 cases/100,000). The mortality rates adjusted to the European population were 13.15/100,000 for males and 1.75 /100,000 for females. Whilst the mortality rate has decline by 0.65% annually since 1997 for males and the mortality rate for females has stabilized, the incidence rate trends showed a progressive rise for both genders up to 2002.

Bladder cancer is a serious public health problem in Spain determined by its high incidence rate and, above all, by the high prevalence of cases. According to the IARC estimates, a total of 12,000 new cases arose in Spain in 2002, the partial prevalence (cases diagnosed within the last 5 years) having been very high, nearing 45,000, a figure very similar to the figure for prostate tumors (Ferlay et al., 2004). The most recent data from the EUROCARE-4 study pointed out that, in Spain, the survival rate for this tumor at 5 years following diagnosis is 73.7%, somewhat higher than that of Europe as a whole (Sant et al., 2009).

The origin of bladder cancer is determined by the vesical epithelium coming in contact with cancer-causing substances which are excreted through the urine. These substances may be ingested or inhaled directly, or rather may come from the metabolism of other products in the organism. The two most important risk factors for this cancer are tobacco and occupational exposure to aromatic amines (Silverman et al., 1992). The occupations associated to a higher risk of bladder cancer include those having to do with the manufacture of aromatic amines, rubbers, dyes, paints, aluminum or leather and with vehicle drivers (Mannetje et al. 1999).

In Spain, the geographical variability of bladder cancer is similar to that shown for lung cancer, reflecting the role played by tobacco smoking. In our country, the greatest number of cases are detected in Girona, Murcia, Navarre and Tarragona. The mortality rate is however higher in Andalusia, Community of Valencia and Rioja.

Oral and Pharyngeal Cancer

The incidence rate of cancer of the bucal cavity and pharynx varies substantially between males and females in all of Spain's registries, due to the difference in the pattern of tobacco smoking and drinking alcohol, which are the main risk factors. According to the most recent incidence estimates we have available at this time (2006), in relation to other countries in Europe, Spain is ranked in an intermediate position regarding both males and females.

The mortality rate declined considerably in males over the past ten years, however remained relatively constant in females.

Within Spain, the Autonomous Communities of Asturias and the Basque Country show mortality rates clearly higher than average for males in Spain, although this not be the case for females, in which the mortality rate is similar to that of other Autonomous Communities.

Laryngeal Cancer

According to estimates for 2006, Spain is the European country with the third highest incidence rate for laryngeal cancer in males and the fifth-ranked for females. The mortality rate is likewise quite high in males, although it has undergone a major annual decline (4.3%) over the last ten years and contrasts with the low mortality rate among females, which has remained constant throughout this same period. Data recently published on the EUROCARE-4 study indicate that 63.8% of the patients diagnosed in Spain within the 1995-1999 period survived an average of 5 years (Sant el al., 2009).

The Autonomous Communities of Asturias, the Basque Country, Murcia and Zaragoza show a higher incidence rate for males than the rest of the Autonomous Communities. However, the mortality rate is higher in Cantabria. In females, the incidence rate ranges from 0.2 cases/100,000 females to 1.1 cases/100,000 females, depending on the Autonomous Community in question. The Basque Country is the Autonomous Community showing the highest incidence rate figures in females, the mortality rate however not differing from the nationwide average.

1.3.3.2. Reproductive system cancers

Breast Cancer

Breast cancer is the most frequent tumor in females in the Western world, it being estimated that, in the European countries, there is an 8% probability of developing breast cancer before 75 years of age (Lopez Abente et al., 2005). Breast cancer shows a great hormonal influence. Many of the risk factors determined – early onset of menstruation, late menopause, not giving birth, giving birth for the first time at a late age and obesity in post-menopausal females- as entailing the mammary gland being exposed to a greater degree to circulating estrogens (Pike et al., 2007). Other risk exposures investigated in the literature include a sedentary lifestyle, early exposure to high doses of ionizing radiation, drinking alcohol, hormone replacement therapy (Key et al., 2001), oral contraceptives, high fat intake, reduced folate intake, exposure to organochlorated pesticides and very low frequency electromagnetic fields (Johnson-Thompson and Guthrie, 2000). The distribution of reproductive and nutritional factors in relation to the socioeconomic level could explain the higher incidence rate found in more upper-class females.

Certain professions (female teachers, female pharmacists, female healthcare workers, female chemical industry employees, female telephone and radio workers and female hairdressers) also show a higher incidence rate, although it is difficult to set the bounds of the influence of specifically occupational factors (Pollan, 2001). Lastly, a family history means a considerably higher risk. Females with alterations in either of the two main susceptibility genes, BRCA1 BRCA2, have a higher probability of developing breast cancer at some time in their lives (Armstrong et al., 2000).

In Spain, the adjusted incidence rate estimated for 2006 was 94/100,000 females, quite a bit lower within the EU context. In most developed countries, the incidence rate of breast cancer rose considerably within the 1970-2000 period. The implementation of programs for screening the population during this period has contributed to increasing the incidence rates. In Spain, the coverage of the female population undergoing screening exceeded 90% in 2001 (Ascunce et al., 2007). Based on the data included in the CIFC (information up to 2002), it is not possible to evaluate the effect that the screening saturation may have on the evolution of the incidence rate due to this type of tumor.

The implementation of early detection programs, in conjunction with the advancements made in diagnosis and treatment have meant a rising survival rate, which, accord to recent EUROCARE-4 data is above 80% at five years following diagnosis in Spain (Sant et al., 2009). Therefore, the mortality rate is no longer valid for studying the frequency rate at which these tumors arise, although it still continues to be the only indicator available for studying the geographical variability within and outside of our country. At the international level, the major differences found half a century ago in the mortality rate for this tumor are tending to cease to exist, making for a much more homogenous pattern.

In Spain, there is no clear-cut geographical pattern, solely Grand Canary Island standing out as the one area having the highest mortality rate (Pollan et al., 2007). This declining pattern affects all of the Autonomous Communities, although the decline may have started at a different point in time. The sharpest drop in the mortality rate occurs in the Balearic Islands, Navarre and Rioja. Navarre was the first Autonomous Community to have implemented an early diagnosis program in 1990 (Ascunce et al., 2004).

Due to its importance, breast cancer research, diagnosis and treatment must be aspects considered top-priority within health policy. From the standpoint of secondary prevention, it is important for the early diagnosis programs to be continues, for the delays in diagnosis to be prevented and for the patients to be assured the very finest of treatment strategies. On the other hand, etiological research must continue, given that the risk factors known up to this point in time would explain less than 50% of the cases of breast cancer observed (Johnson-Thompson and Guthrie, 2000).

Uterine/Cervical Cancer

Uterine cancer is one of the most important female tumors in the world. It is estimated that, in 2002, nearly 700,000 new cases a year and more than 300,000 deaths occurred (Ferlay et al., 2004), making this cancer the second highest-ranked in incidence in females after breast cancer, and the third highest-ranked in mortality, after breast cancer and lung cancer. This category encompasses two types of tumors of completely different etiologies and geographical distributions depending on the portion of the organ which is affected: cancer of the cervix cervical cancer and uterine or endometrial cancer.

Cervical cancer is responsible for 71% of the incident cases and for 84% of the deaths due to uterine tumors worldwide, with an incidence rate nearly two times higher in the developing countries than in the industrialized countries, the opposite of uterine cancer, which is nearly four times more common in the developed countries.

Cervical cancer occurs as a result of the infection by certain types of Human Papilloma Virus (HPV). This tumor is especially important from the public health standpoint, given that it is to a great extent a cause of mortality preventable by means of early detection programs and the treatment of precancerous lesions (Gispert et al., 2007).

Spain is one of the European countries with the lowest cervical cancer incidence and mortality rates, with 2,243 cases and 808 deaths estimated for 2006. There is a strikingly great difference in the incidence rate figures from one registry to another, there being incidence rates in Mallorca, for example, which are twice as high as those recorded in Navarre. The information published up to 2002 reflects the stabilization or decline in the cervical cancer incidence rates in five of Spain's cancer registries (Granada, Murcia, Navarre, Tarragona and Zaragoza).

Regarding endometrial cancer, which is more frequent that cervical cancer in our country, the incidence rate in Spain must also be said to be low in comparison to the other EU countries. It is estimated that a total of 3,864 cases of endometrial cancer we diagnosed and 1,155 deaths occurred due to this cause in 2006. The incidence rates rose constantly as of 1983 (the opposite of cervical cancer), and there is the incidence rate figures vary less from one register to another.

The mortality rate for uterine cancer overall has declined by nearly 1.5% annual over the past ten years. The study of the mortality trends due to this cause is usually conducted by grouping together all the cases instead of distinguishing between cervical and endometrial cancer, given that there is a major problem involved due to the poor certification of mortality due to this cause (Pérez Gómez et al., 2006). The percentage of deaths due to uterine cancer classified in the unspecified uterine category, in which no distinction is made between endometrium and cervix, varies from one country to another and has been declining over the course of time due to the improvements made in the quality of death certifications, giving rise to artifacts in the time trends which make it necessary to adopt reclassification strategies for these artifacts.

Hence, in the 1960's in Spain, a total of 93% of the cases of uterine cancer were classified as "unspecified uterus" Levi et al., 2000); whilst, starting as of 2000, this percentage has dropped below 25% (Rodríguez Riero et al., 2009).

An analysis has been published recently of the mortality rate due to cervical cancer within the 1974-2004 period in the different Autonomous Communities in Spain, incorporating reassignment of unspecified uterine cancer cases (Rodríguez Riero et al., 2009). The results thereof show the cervical cancer mortality rate to be clearly declining, although the rate of decline varies from one Autonomous Community to another; in Catalonia and Navarre, the mortality rate is showing a sharper decline of over 4% annually, whilst in the Autonomous Communities of Madrid, the Canary Islands and Galicia, they are showing a lower annual rate of change of less than 2.6%.

The evolution of the cervical cancer mortality rate could change in the future due, above all, to HPV vaccine being incorporate into the childhood vaccination schedule and to the change entailed in the increased population from other countries with a higher HPV prevalence and the measures which are taken regarding the early detection programs. Monitoring the incidence and mortality rates will serve to assess whether these strategies are achieving the desired goals.

Ovarian Cancer

Ovarian cancer was the seventh-ranked cause of death in 2006. Spain and Portugal are the European countries showing the lowest incidence rate (incidence rates of less than 8 cases/100,000 females). Up until 1998, Spain and Greece had been the European countries where the mortality rate was rising to the greatest degree, these trends having parallel a rise in the incidence rates. However, since 1998, both the incidence trends and the mortality trends stabilized in Spain.

Most of the deaths due to ovarian cancer occur in females who are over 50 years of age. Up until the 1990's, the ovarian cancer mortality rates in females under 50 years of age remained stable, whilst the mortality rates in females over 50 years of age doubled. Beginning as of 1997, the mortality rates began to decline in the youngest groups and stabilized in the oldest groups. The improvement in the treatments and early diagnosis were undoubtedly the reasons for this stabilization (Muggia and Lu, 2003; Hankinson SE, 2006).

Prostate Cancer

In the EU countries, prostate cancer is the most frequent form of cancer in males. In 2006, prostate cancer was the top-ranked malignant tumor in incidence, with an adjusted rate of 102.3 cases / 100,000 inhabitants, although some major difference were found to exist from one country to another, ranging from Ireland's rate (182 cases/100,000) and that of Romania (32.2/100,000).

In many Western countries, including France, Sweden and German, prostate cancer has become the most frequent tumor among males as of some years ago.

The incidence rate has been found to have risen over the past few decades, due mainly to the expanded use of early detection procedures (Nelen, 2007).

In Spain, prostate cancer has continued to be ranked in third place as the cause of death in males over the past few years, after lung tumors and colorectal tumors. Prostate cancer is a neoplasia which is highly rare in males under 50 years of age, the age as of which the incidence rate rises faster than in any other cancer. Prostate cancer has its greatest impact on the population subgroup with a shorter life expectancy: 90% of the cases arise in males over 65 years of age and cause death at over 75 years of age. In 2006, a total of 5,409 deaths were caused by this tumor, meaning a rate standardized by age of 18 deaths / 100,000 inhabitants. In the EU, prostate cancer is also the third leading cause of death, the rate for all of the European Union countries as a whole being 22.9/100,000 in 2001.

Within Spain, the differences from one Autonomous Community to another are not highly marked, no clear geographic pattern being noted. As of 1997, a sharp decline in the mortality rate for this tumor has been observed, at a 3.4% annual rate. This drop is patent in all of the Autonomous Communities.

Many prostate cancers remain latent, and solely one third of those which are discovered in autopsies have manifested themselves clinically. The etiology and the agents which promote the progression to a clinically manifest tumor are unknown, different risk factors having been suggested, including certain hormonal patterns, a family history of prostate cancer and diet (Ross, 1966). The relative survival rate at 5 years estimate for Spain is around 75%, similar to the European survival rate (74%) (Sant et al., 2009).

1.3.3.3. Digestive system and liver cancers

Esophageal Cancer

Esophageal cancer is not a very frequent tumor in males and is highly infrequent in females, having a high lethality rate. The etiological factors of this malignant tumor vary depending on the histological type. Barrett's esophagus and obesity are associated with esophageal adenocarcinomas, whilst smoking and drinking alcohol are the main risk factors for squamous cell carcinoma (Morgan, 1995).

Solely 10% of the males who have esophageal cancer survive more than 5 years, although this survival rate is fortunately improving in most European countries. Generally speaking, survival is longer in females (Coleman et al., 2003).

The EUROCARE-4 study shows that the relative five-year survival rate for males and females was 9.7% in Spain and somewhat higher in the EU countries as a whole, in patients diagnosed within the 1995-1999 period (Sant el al., 2009). Generally speaking, an improvement is noted in the survival of esophageal cancer patients in the European countries, which seems to be related to a change in the patterns of the frequency of onset of the histological types of esophageal cancer, specifically a recent rise in the adenocarcinoma incidence rate and the use of surgery for the treatment thereof (Karim-Kos et al., 2008).

In Spain, for the 1998-2002 period, the Autonomous Communities of the Basque Country and Canary Islands showed esophageal cancer incidence rates noticeably higher than those of other Autonomous Communities, on the order of 11 cases/100,000 males. The mortality rates were 6.5 deaths/100,000 males and 0.7 deaths/100,000 in females for the 2002-2006 five-year period. In males, the mortality rate dropped by 2.1% annual as of

1997, whilst the mortality rate for females dropped by 1.7%. Also in males, as was also the case for oral cancer, the Principality of Asturias and the Basque Country showed a mortality rate which was rather much higher than the rest of the Autonomous Communities and the average for all of Spain, this being a feature much less patent in females.

Stomach Cancer

Stomach cancer was the most frequent digestive system tumor in both genders throughout the last half of the twentieth century. However, the drop in digestive system incidence and the rise of colon and rectal tumors has placed gastric cancer in second place among the digestive tumors in the developed countries, regarding both their incidence rate as well as their mortality rate. Their distribution shows major geographic variations, both from one country to another as well as from one region of those countries to another. Stomach cancer is more frequent in males, with a male to female ratio of 2.

In Europe, gastric cancer is ranked sixth in importance in incidence in males and fifth in importance in females. In Spain, gastric cancer is the seventh most important cancer in both males and females, with an estimated rate for 2006 of 15.9 cases/100,000 inhabitants for males and 8.4 cases/100,000 inhabitants for females, slightly below the EU average. Regarding the mortality rate, this tumor is ranked fifth in importance in males (after lung, colorectal, prostate and bladder cancer) as well as in females (after breast, colorectal, lung and pancreatic cancer). According to the latest data published, gastric cancer was the main cause of death in 3,533 males and 2,170 females in 2006, means a rate standardized by age of 13/100,000 inhabitants in males and 5.5 /100,000 in females. The gastric cancer survival rate continues to be poor, less than 28% at 5 years in our country, these being figures which are higher than the European average (24.5%) (Sant et al., 2009).

The analysis of the mortality time trend in Spain shows a major drop of over 3.5% annually as of 1987, similar in males and females. The geographical distribution of this tumor is highly characteristic within the National Health System, there being some major regional differences. Despite the drop in the mortality rate which has taken place over recent decades in practically all of the provinces, a “coast-inland” pattern previously described (Lopez-Abente et al., 2001) continues to appear. The highest rates are those of Castile and Leon, which are among the highest in Europe.

The factors mentions as cause of the evolution of the gastric cancer epidemic at the international level are related to the socioeconomic level of the individuals, and the decline in the incidence and mortality rates for this tumor is usually interpreted as a result of the development of the industrialized countries. The socioeconomic level is one variable which indirectly reflects the exposure to different factors, such as the type of diet, the prevalence of helicobacter pylori infection, smoking or certain occupational exposures. However, the fact that a country like Japan has some very high stomach cancer rates indicates that the socioeconomic level is not a variable which adequately takes in all the risk exposures for gastric cancer, and that the environmental and/or cultural factors inherent to the different lifestyles (quite especially the diet) may be of considerable importance. This would also help to explain the major differences we also find in Spain among some provinces. Other risk factors related to this tumor are a past history of a partial gastrectomy, a family history of gastric cancer, pernicious anemia, blood type A and exposure to ionizing radiation (Roder, 2002; Brenner et al., 2009).

Colorectal Cancer

Colon and rectal cancer is the third most frequent cancer in males in the EU, outranked solely by prostate cancer and lung cancer, and is the second most frequent in females, after breast cancer.

Spain is ranked in an intermediate position in males in relation to other European countries, whilst the incidence rate among females is low.

In Spain, it is estimated that, in 2006, a total of 14,564 cases of colorectal cancer were diagnosed in males and 7,766 cases in females. The sex ratio shows males to predominantly be affected by colorectal cancer. The mortality rates are high, being the tumor site ranked second in importance in males and females. In this same year, a total of 7,585 deaths occurred in males and 5,490 deaths in females.

The fact most worthy of special note is the considerable rise in the incidence rate of colorectal cancer in all of Spain's registries, especially in the males, which does not seem to be influenced by the screening, given that the pilot population-based programs were not started up until 2000 in Catalonia and 2006 in Valencia and Murcia.

This growing incidence rate contrasts with the mortality trends, which have remained stable in males as of 1997, but which has been declining at a rate of 1.2% annually in females as of that same year. The recent mortality rate trend toward stabilization or decline may reflect the improvements in the treatments, the advantages resulting from an early diagnosis as these tumors are quite readily accessible for sigmooidoscope examination and the use of complete colonoscopies in identified risk groups having become widespread.

In Spain, the number of new cases per year is estimated as being around 24,000 in number in both genders compared to 13,000 deaths, according to the 2006 data. However, in these tumors, the mortality data does not reflect the true incidence rate of this disease, given that the survival rate has improved over the past few years, mainly in young people. The latest data from the EUROCARE-4 study for patients diagnosed within the 1995-1999 period in Spain show a 54% survival rate at 5 years (Sant et al., 2009)

The known etiological factors include genetic predisposition and the diet-related factors. The most frequent form of colorectal cancer is that of the sporadic types, there being cases involving hereditary aspects: familial adenomatous polyposis and hereditary non-polyposic colorectal cancer (Winawer et al., 1990), which are estimated as being involved in 10%-15% of the cases. Other risk factors described are a greater intake of meat and animal fats, drinking alcohol (especially in males) and a low fiber intake (World Cancer Research Fund / American Institute for Cancer Research, 2007). Some protective factors to which reference has been made are eating vegetables, fruit, fiber, calcium and aspirin. Taking into account the importance diet has in the genesis of this tumor, the incidence rate and mortality rate data in Spain suggest more healthy eating habits among females. This difference would be less marked in Spain in the younger generations.

Sufficient scientific evidence exists as to the benefit of the early colorectal cancer detection programs. However, solely three Autonomous Communities have carried out population screening programs in an experimental phase, although it is expected to be possible to expand this type of programs to other regions on a short-term basis (Salas-Trejo et al., 2007; Peris et al., 2007). It is suggested that the target population initially be males and females within the 50-69 age range and that the screening test would be the detection of fecal occult blood with a two-year periodicity.

Pancreatic Cancer

Pancreatic cancer is rather unusual in males and females in the EU, although it entail a great burden of mortality, given that solely 5.7% of pancreatic cancer patients survive for more than 5 years. In males, the incidence rate ranges from 15.9 cases/100,000 in Slovakia to 6.8 cases /100,000 in Sweden.

In females, pancreatic cancer ranges from 11.7 cases/100,000 in Denmark to 4.8 cases / 100,000 in Portugal. Spain falls in between these two, with 9.9 cases/100,000 for males and 5.7 cases /100,000 for females.

In Spain, pancreatic cancer was the fifth most lethal tumor in females in 2006. The mortality rates rose during the 1997-2006 period by an average of 0.8% annually in males and 1.3% annually in females, although these figures would vary depending on the Autonomous Communities in question. The stabilization of the rates in some regions might be attributed to a decline in the prevalence of some risk factors, such as, for example, obesity, type II diabetes or occupational exposure to certain dyes or pesticides (Giovannucci and Michaud, 2007; Michaud, 2004; Lo et al., 2007). Regrettably, there have been no major changes in the treatment of pancreatic cancer over the past few years which may have had an impact on the mortality rate.

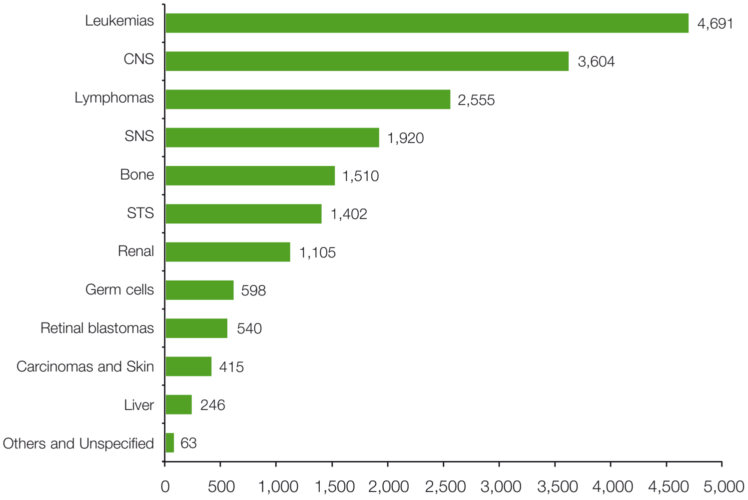
1.3.4. Childhood tumors

Childhood and adolescent cancer has histological, clinical and epidemiological characteristics which differ from adult cancer which makes it necessary for these cancers to be studied separately from one another. The childhood cancer incidence rate in Spain is stable, the mortality rate having decline thanks to the success of the advancements in treatment.

The predominant histological types in childhood are leukemias, brain tumors, lymphomas and sarcomas (**Fig. 2)**, unlike in adults, in whom carcinomas are predominant. Approximately 140 cases for every 10^6 children within the 0-14 age range are diagnosed with cancer every year in Spain (**Table 8**). Taking Spain's 2006 population, the annual of new cases within the 0-14 age range is 925-950; and within the 15-19 age range, 425-450 cases.

The National Childhood Tumor Registry (RNTI) is the reference point for ascertaining the epidemiological data of this disease in Spain (Peris-Bonet, 2008). Currently, the National Childhood Tumor Registry has recorded a total of 19,798 new cases since the beginning of the 1980's for Spain as a whole. A total of 18,918 (96%) of the aforementioned cases are within the 0-14 age range, 880 /5.5%) being over 14 years of age; 57% being male children and 43% female children.

Fig. 2. Cases registered in the National Childhood Tumor Registry. Age: 0-19. Period: 1980-2008.



Source: National Childhood Tumor Registry. 2009 Report.

The incidence rate of childhood cancer in Spain is similar to that of Europe. **Tables 8** and **9** show the incidence rate (0-14 years of age) in Spain based on the geographic area of Aragon, Catalonia, Basque Country and Navarre, where the thoroughness of the National Childhood Tumor Registry is around 100% (Ratio observed/expected = 1.04 (95% CI: 1.01-1.08), and Fig. 2 shows the incidence rate for Spain in conjunction with the European incidence rate (Stiller et al., 2006).

Table 8. **All childhood tumors. Average incidence rate in Spain. 1990-2006 period. Age: 0-14.**

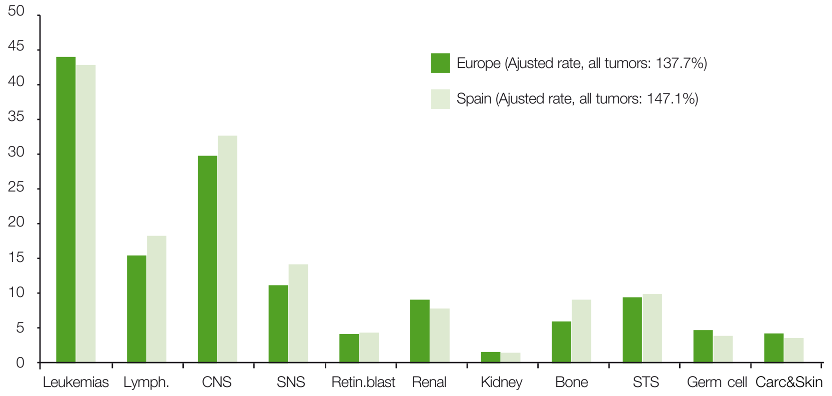
Incidence rate x 106	All tumors
0 years of age	194.1
1-4 years of age	190.9
5-9 years of age	122.6
10-14 years of age	111.6
Gross rate	140.9
Rate adjusted by age	147.1

Source: National Childhood Tumor Registry (Peris-Bonet, 2008 690)

Table 9. **Childhood cancer incidence rate in Spain. Period: 1990-2006. Age: 0-14. Source: National Childhood Tumor Registry (Peris-Bonet, 2008, 690).**

Incidence rates x 106 (*Rate adjusted by age by world population IARC).								
	%	**0**	**1-4**	**5-9**	**10-14**	**Gross**	**ASRw**	**M/F**
Leukemias	28	33.9	69.8	36.6	23.3	39.8	42.8	1.5
Lymphomas	14	4.4	14.2	18.4	25.8	19.2	18.1	2.2
HL	5	0.0	2.6	4.4	15.1	7.6	6.6	1.7
NHL	8	3.1	11.1	13.8	10.7	11.3	11.2	2.5
CNS	23	20.7	36.3	36.9	26.6	31.9	32.5	1.3
SNS	8	77.1	20.1	4.0	1.0	11.5	13.9	0.9
Retinal blastomas	3	19.4	8.0	1.1	0.0	3.6	4.4	1.1
Renal	5	17.6	16.2	3.3	1.2	6.6	7.8	0.8
Liver	1	6.3	2.9	0.4	0.1	1.3	1.5	1.7
Bone	7	1.9	4.0	8.4	16.3	9.8	8.8	1.3
STS	7	11.9	12.5	8.4	7.1	9.2	9.6	1.4
Germ cell	3	10.7	4.3	2.0	3.9	3.8	4.0	1.0
Carcinomas and skin	3	2.5	1.9	2.9	6.3	3.9	3.5	0.9
Others and unspecified	0	0.6	0.5	0.1	0.1	0.2	0.3	1.0
TOTAL	**100**	**194.1**	**190.9**	**122.6**	**111.6**	**140.9**	**147.1**	**1.3**

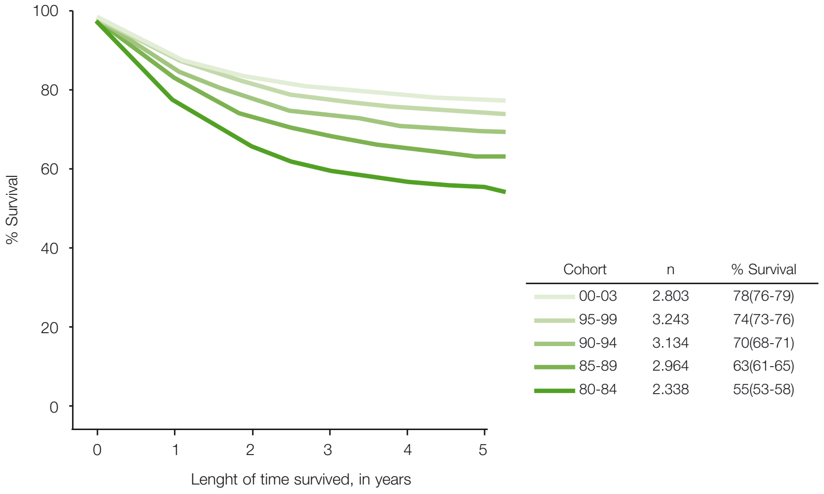
Fig. 3. **Incidence rate of childhood cancer in Spain (1990-2006) and Europe (1988-1997) by tumor type. Age: 0-14.**



Source: Spain: National Childhood Tumor Registry {Peris-Bonet, 2008 690 /id}; Europa: ACCIS (Stiller et al., 2006)

The childhood cancer survival rate in Spain is likewise similar to that of the countries in our surrounding environment, totaling 78% (Fig. 4).

Fig. 4. **All tumors. Survival rate observe at 5 years following the diagnosis in the NCTR by cohorts of years of diagnosis. Period: 1980-2003. Age: 0-14 years.**



Source: National Childhood Tumor Registry, 2009 Report.

The secondary effects resulting from childhood and adolescent cancer treatments are currently cause for concern, the design of new protocols thus aiming at modifying or reducing the treatment for those children who have a good prognosis, whilst continuing to intensify the treatment in those tumors which are still as yet incurable. The sequelae of cancer treatment in children are well-known: early death, secondary tumors, organic sequelae (cardiac, pulmonary, endocrinological, neurological), psychological and social (difficulty of finding a job or of taking out life insurance or health insurance). In short, sequelae which may lead to a lesser quality of life than their peers who had not become ill (Robinson et al., 2009).

SUMMARY

- According to the estimates made based on the data furnished by the population-based registries, a total of 183,201 new cases of cancer were diagnosed in Spain in 2006. In males, prostate cancer was the most frequent, following by lung cancer and colorectal cancer. In females, the cancer most commonly diagnosed was breast cancer, following by colorectal cancer and lung cancer.
- In comparison to the incidence rate of the countries in our surrounding environment, the males in Spain show an incidence rate slightly lower than the EU average. However, Spanish females show low incidence rates compared to other EU countries.
- In 2006, three out of every 10 deaths in males and two out of every 10 deaths in females were due to cancer. In terms of absolute mortality, the most important tumors for the males were lung cancer (16,859 deaths), colorectal cancer (7,703 deaths) and prostate cancer 5,409 deaths)in 2006; and in females, breast cancer (5,939 deaths), colorectal cancer (5,631) and lung cancer (2,624 deaths).
- Within the last ten years, the cancer mortality rate for Spanish males underwent an average 1.3% decline annually, this drop being found in most tumors, to a greater or lesser degree. Solely the cancers of the small intestine, colon and rectum, melanoma and pancreatic cancer showed a slight rise in the annual mortality rate (less than 2%). Lung cancer in males shows itself to be declining in our country over the last ten years.
- In females, for the 1997-2006 period, the cancer mortality rate declined by an average of 1% annually. This decline becomes patent in most of the malignant tumors, although special mention must be made of the decline in the mortality rate due to breast cancer (1.8% annually) and the sharp drop in skin, gallbladder, stomach and bone tumors, with over 3% drops annually. However, the lung cancer mortality rate

in Spanish females shows a clear rise (3.1% annually). The pancreatic cancer mortality rate also showed an increase (1.3%).

- The main etiological factor involved in cancer is tobacco. The males in Spain show high incidence rates and mortality rates for smoking-related tumors. Nevertheless, the surveys on smoking show a downward trend in males. On the contrary, a low incidence rate and mortality rate is currently noted for Spanish women for this type of tumors, but the rise in smoking among females has meant an increase in lung cancer in the 1990's, and the forecasts for the future are not very optimistic.
- In all of Spain's registries, breast cancer is the most frequent tumor in females, being responsible for over 25% of all of the cancer cases, followed by colon cancer and lung cancer. The early breast cancer detection programs, in conjunction with the advancements made in treatment have contributed to reducing the mortality rate for this tumor in our country. The new screening programs must be implemented with a population-based criteria and allocated the necessary resources and must have quality indicators making their evaluation possible.
- Spain is one of the European countries which has one of the lowest cervical cancer incidence and mortality rates. The evolution of the cervical cancer mortality rate could change following the HPV vaccine being included in the childhood vaccination schedule and the measures which are being adopted regarding early detection programs. Monitoring the incidence rate and mortality rate will serve to assess whether these strategies are achieving the desired goals.
- Colorectal cancer is the most frequent tumor in Spain if both genders are considered together and is the second-ranked cause of cancer mortality in both males and females. Sufficient scientific evidence exists as to the benefit of early detection programs. Although there are some pilot programs in place in Spain, and the high-risk individuals are generally excluded from monitoring protocols, these programs have not as yet been expanded to the general population.
- The childhood cancer incidence rate in Spain is similar to the European incidence rate, whilst the childhood cancer mortality rate has declined thanks to the success of the advancements in treatment. However, special emphasis must be place on the secondary effects resulting from childhood and adolescent cancer treatments. Numerous studies address the design of new treatment products, so as to be able to modify or reduce these effects in those children who have a good prognosis.

1.4. Situation analysis by strategic line

1.4.1. Health Promotion and Protection

In order of importance by their direct repercussion (heightened cancer incidence rate) and by the degree of certainty of their carcinogenic implication, tobacco, certain diet-related aspects, obesity, physical activity, alcohol, occupational and environmental exposure must be considered as being the agents of greatest interest.

Tobacco

Tobacco smoking is unquestionably responsible for increasing the probabilities of having a great number of diseases. Smoking is the main factor responsible for cancer, including lung cancer (85% of lung cancer cases being estimated as being caused by tobacco) and oral, laryngeal, pharyngeal, esophageal, pancreatic, bladder and kidney cancer (Schottenfield, 1996). Exposure to tobacco smoke in the air (second-hand tobacco smoke or passive smoking) is similarly considered to be a risk factor for a number of diseases in children and adults, especially for lung cancer (IARC, 2002).

In Spain, the mortality rate which can be attributed to tobacco was estimated at 14% of the total mortality rate, in other words, approximately 56,000 deaths annually (Banegas et al, 2001).

Regarding tobacco smoking in Spain, a progressive rise in the prevalence took place up to reaching its peak value around 1975, then stabilizing for ten years, to subsequently decline progressively to present. In females, the spread of the smoking habit is different, with a very low prevalence of smoking up to the 1970's, as of which point in time this prevalence rose nonstop up to 2003 (Fernández et al., 2003). According to the National Health Survey (2003), daily tobacco smoking in people over 15 years of age amounted to figures of 34.15% in males and 22.39% in females. The daily tobacco smoking data for people over 15 years of age in the 2006 National Health Survey amounted to figures of 31.6% in males (2.6% lower) and 21.5% in females (0.9% lower).

The tobacco smoking data for a population older than 15 years of age show figures of 26.4% daily smokers and 3.1% occasional smokers, as compared to 20.5% ex-smokers.

This, in conjunction with the high healthcare and social cost, combines with the fact of the smoking habit being a risk factor subject to prevention, has made reducing tobacco smoking prevalence the main objective of the health policies in Spain, as is set forth under the National Plan for the Prevention and Control of Tobacco Smoking (2003-2007) and the Integral Ischemic Heart Disease Plan (2004-2007).

In keeping with the aforementioned plans, objectives, critical points, actions and indicators have been set for controlling tobacco smoking in this Strategy.

The arguments in this regard are so overwhelmingly clear that the role of the governments is tending toward progressively more radical positions. This attitude is favored by the pressure being exerted by the citizenry, on one hand and the social costs on the other, making it necessary to reassess the economic agent role (taxes, production, employment) which tobacco undoubtedly plays. This growing concern has resulted in noticeable headway being made in several directions, which are detailed in following.

a) Regulatory and Legislative

Different countries have passed a number of laws of varying degrees of importance and scope of application over the last twenty years (France's Evin Law of 1991; Royal Decree 192/88 and Royal Decree 1079/2002 in our country). Similarly, the European Union has developed broad-ranging labor regulations (Directives including those of July 1998, June 2001 and December 2002). The WHO has been working since 1994 on the member states preparing and adopting an International Treaty on Tobacco Control (WHO, 2002), as well as the Framework Convention for Tobacco Control (WHO, 2003). Without delving into any greater depth and straying from the objective of this document, the main lines of interest of these rules of law are focused on:

- Agreements on tax policy to be enforced on tobacco and on the fight against illicit tobacco trafficking.
- Further broadening the prohibition of smoking in public places.
- Limitation of tobacco advertising and promotion.
- Improvement of the consumer information on the effects/composition of tobacco.
- Carrying out preventive / tobacco use cessation measures.

However, it must be said that the interest in the application of this regulation on the part of the different countries has differed from one country to another (Gilmore et al., 2002), revealing once again the difficulty of this type of problems in which the health-oriented sense does not always prevail over other considerations. Lawsuits have hesitantly started to trickle, one by one, into the courts, being brought against the tobacco companies through association and governmental instances, which are revealing of this nearing of the more radical aforesaid positions.

b) Specific plans to combat tobacco smoking

In most of the countries in our surrounding environment, these regulations have been associated with the implementation of specific plans for combating tobacco smoking which have been focused on facilitating at least five objectives being accomplished:

- Reducing the prevalence of smokers. A frequent figure in our environment is that of achieving a rate of less than 20% for smokers older than 16 years of age and 0% in those younger than age 16. Reducing the percentage of smokers among the healthcare professionals is particularly stressed.
- Protecting the non-smoking population by means of express prohibition or limiting spaces.
- Improving the general information on the ingredients of tobacco products and their toxic effects.
- Active tobacco habit cessation help, particularly with the creation and improvement of accessibility to the tobacco cessation consultations and dispensing nicotine replacements and drugs free of charge.
- Special attention for the highest-risk populations at which the pro-tobacco advertising is being targeted to the greatest extent at this time: young people, females and marginal population.

The different tobacco control pans have some characteristics in common. The first of these characteristics is the systematic inclusion of measures for assessing the impact of the strategies adopted, given that they are effective to a only a minor degree, and the economic resources for carrying them out compete with other healthcare and non-healthcare needs. The second characteristics is that they entail specific strategies for "detrivializing" and "denormalizing" tobacco smoking, above all among young people, in an attempt, here once again, to keep abreast of the tobacco companies' messages (*Ministère de la Santé, 2003*).

c) Evaluation of the strategies for combating tobacco smoking

We have the literature of evaluations of the impact of the different measures in terms both of reducing the number of smokers as well as improvements in health. Of all these evaluations, those which have an impact on the demand by way of raising the prices, eliminating advertising and specific prohibitions are those which give the best results. Quite eloquently, it is estimated that an overall 10% rise in the price could mean saving more than 10 million lives (Jha el al., 2000).

The strategies for implementing methods for helping to quit smoking (minimal advice, specific consultation) as well as the administration of nicotine replacements are showing some good, cost-effective results when they are compared with other health measures (Silagy et al., 1999 and 2002).

The educational strategies designed for preventing the smoking habit in young people are meeting with poor results. The most effective strategies are, however, those which are presented with a great deal of coherence with the medium (avoiding dual messages or contradictions), underling the role of manipulation being sought by the tobacco manufacturing industry and those in which a certain reference to fear is present (Witte et al., 2000).

As the experience in the U.S. - a pioneer concerning this issue - has gone to show, the strategies encompassed within complete, multisectorial, antitobacco plans for action with specific programs that cover most of the vulnerable aspects (starting the habit, young people, help for smokers, prohibition of spaces…) and which have a credible funding maintained over the course of time area always more highly effective than legislative measures (Siegel, 2002).

Situation in Spain

The National Health System Interterritorial Council meeting held in January 2003 approved the National Plan for Tobacco Prevention and Control (2003-2007), the objective of which is to coordinate the different legislative, health plan and other actions for combatting tobacco smoking in our country. This Plan is focused particularly on:

- Special smoke-free workplaces (schools, medical centers, public centers and entertainment centers) with an objective of 95% thereof being smoke-free in 2005 and regulations on smoke-free places (70% of companies).
- Unifying tobacco sale prohibition criteria (elimination of tobacco being sold on a non-personal basis, loose packs, and packs of less than 20 cigarettes).
- Prohibition of advertising and sponsorship.
- Setting out taxation and price rise measures.
- 2007 objective: 21% ex-smokers and less than 34% smokers within the 16-25 age range

Most of these objectives have been covered as of the entry into effect of Law 28/2005, although further expansion thereupon and the implementation thereof has not been uniform throughout the entire country. Nevertheless, it would be advisable to further expand upon some aspects stipulated under the text of this Law which have solely been set forth however not as yet made fully operative, such as the National Observatory for the Prevention of Tobacco Smoking, the activities of which could be tools for effectively evaluating and monitoring tobacco prevention and control.

Diet, obesity and physical activity

Nutritional factors are other factors related to preventing cancer.

The foregoing includes diet, obesity and also physical activity, given that they involve interrelations worthy of being taken into account. The studies on the effects of diet entail some methodological difficulties, as the diet includes substances the effects of which are unknown to us, in addition to the fact that their components undergo interactions with one another and with other environmental or genetic factors (Chesson et al., 1997). Despite this, sufficient indications exist as to causal connections existing among diet, nutrition and cancer to set out recommendations based on these indications targeting both the political authorities as well as the general population.

The data currently available suggests diet-related aspects causing around one third of all the deaths due to cancer. It is estimated that 30%-40% of all tumors in males and up to 60% of those in females are diet-related (Doll & Peto, 1996, WCRF, 1997).

Recommendations regarding eating, in conjunction with maintaining physical activity and an appropriate body mass index could contribute, over the course of time, to reducing the cancer incidence rate by 30%-40%, especially breast cancer (post-menopausal females), endometrial, colon, renal and esophageal cancer. (WCRF, 1997; WHO-FAO, 2003).

Convincing or probable tests are available according to which diets rich in vegetables and fruit protect against oral, pharyngeal, esophageal, lung, stomach, colorectal, laryngeal, pancreatic and bladder cancer .(WCRF, 1997; Key et al., 2002; WHO-FAO, 2003; Riboli, E., 2003).

Convincing evidence exists as to physical activity safeguarding against colon cancer, (Hill, 1999; WCRF, 1997; WHO-FAO, 2003).

Just as a large body mass increases the risk of endometrial cancer, obesity increases the risk of breast cancer in post-menopausal females, endometrial cancer, colorectal cancer, renal cancer and esophageal cancer, the degree of evidence available in this regard being convincing.

Different authors have analyzed the potential impact on life expectancy and the mortality rate, by some types of cancer, of some of the preventive measures related to diet, regarding which there is a more than convincing degree of evidence:

- Diets rich in abundant amounts of varied vegetables and fruits would prevent 20% or more of all cancer cases (Van't Veer et al., 2000; Gundgaard et al., 2003; Pomerleau et al., 2003).
- An alcohol intake within recommended limited would prevent up to 20% of the cases of cancer of the aerodigestive system, colorectal and breast cancer (WCRF, 2007).
- Stomach cancer is prevented, above all, with proper diets. Colorectal cancer is prevented mainly with proper diets, maintaining or increasing physical activity and keeping a proper body weight (WCRF, 1997; WHO-FAO, 2003).

An interesting study revealed the safeguarding effect of closely following the diet guides for tumors located in different sites. This effect was attenuated or even ceased to be significant when solely the diet-related aspects were considered and a Body Mass Index (BMI) within the normal range (18.5-24.9 kg/m2) and performing regular physical activity (Hamack et al., 2002) were left out of the recommendations.

Obesity

The most recent results of the Spain's 2006 National Health Survey are as follows: a prevalence of overweightness and obesity in the adult population over 18 years of age is estimated at 37.43% and 15.25% for both genders, with difference between males and females. Hence, whilst the prevalence of overweightness and obesity is 44.42% and 15.54%, respectively; in females, the overweightness is 30.27% and obesity 14.95%. In the childhood population (2-17 age range), the percentage of the population which is overweight or obese for both genders is 18.48% and 9.13%. The percentage in children and young people who are overweight or obese is 19.67% and 9.39%, whilst lower figures are found for girls: 17.24% and 8.86%, respectively.

The comparison of the results of the successive health surveys, always employing the same methodology, makes it possible to see how this problem is undergoing a growing trend.

This trend has been associated with a sedentary lifestyle, changing in eating patterns and, very young children, also with the absence of breastfeeding (Gutiérrez-Fisac et al., 2000).

Diet

The total fat intake in the average diet in Spain, according to the findings of the eVe study [individual eating analysis] is high (Aranceta et al., 2000). In the childhood and juvenile population, the findings of the Kid study suggest that 88% have fat intakes totaling more than 35% of their energy intake, and that in 96% of the cases, the saturated fatty acid intake provides more than 10% of the daily calories. The average estimated fruit and vegetable intake (3 servings / day) is far from the recommended five daily servings, totaling around 400 g/day. A total of 88% of the children and adolescents and 56% of the adults within the 25-60 age range do not regularly include the proper amount of fruits and vegetables in their diet.

Physical activity

According to Spain's 2006 National Health Survey, a total of 40.38% of Spain's population does not engage in any physical activity during their leisure time. A total of 36.90% of this percentage refers to male population and 43.70% to female population.

Effectiveness of the diet and physical activity strategies

Different institutions and agencies have proposed measures related to diet and physical activity aimed at preventing the chronic diseases with the highest prevalence in the developed societies, the most prominent one of which is cancer. The World Cancer Research Foundation (WCRF) and the American Institute for Cancer Research (AICR) started up an intensive program in the 1990's aimed at encouraging eating fruits and vegetables. The European Code Against Cancer also takes in this measure.

The EURODIET project set out some nutritional objectives to be achieved for this same purpose, based on the analysis of the food intake and epidemiological situation (Kaftos and Codring ton, 2001). Within the 1999-2001 period, the Spanish Community Nutrition Society coordinated the work of more than one hundred experts in nutrition and public health in the process of setting out the nutritional objectives and diet guides for Spain's population (SENC, 2001).

World Health Organization data suggests that, in Europe, the budget allocated to the health promotion strategies by the European Union member states totals on the average of less than 1% of the healthcare spending (WHO, 1997).

Systematic revisions analyzing the effectiveness of different interventions aimed at fostering healthy eating habits and regular physical activity have made it possible to identify some characteristics which favor a greater impact on health (Roe et al., 1997; Hilldon and Thorogood, 1996). One other aspect which is outstanding is the need of employing a multidisciplinary approach, using multiple complementary strategies, including actions at the individual, community, environmental, regulatory and political level. Solely disseminating information is not effective (Stockley et al., 2001).

Strategy for Nutrition, Physical Activity and Prevention of Obesity (in Spanish, NAOS)

In Spain in 2005, what was then the Ministry of Health and Consumer Affairs prepared a Strategy for Nutrition, Physical Activity and Prevention of Obesity through the Spanish Food Safety and Nutrition Agency (AESAN) which is for the end purpose of improving the eating habits and promoting regular physical activity on the part of all citizens by focusing special attention on prevention during childhood. This Strategy demonstrated the major likelihood of an obese child growing up to be an obese adult.

The Strategy for Nutrition, Physical Activity and Prevention of Obesity has as its main goal that of fostering healthy eating and promoting physical activity in order to reverse the upward trend of the prevalence of obesity and to thus substantially reduce the morbidity and mortality rates which can be attributed to chronic diseases.

For more information on this Strategy, please visit the following website: http://www.naos.aesan.msc.es/naos/ficheros/estrategia/estrategianaos.pdf

Alcohol

The relationship between drinking alcoholic beverages and developing malignant tumors is well-known.

Some aspects which can be stated are:

- Alcohol increases the risk of lip, oral, pharyngeal, esophageal, laryngeal and, to a lesser degree, stomach, colon, rectal and prostate cancer, the relationship being of a linear type (the greater the amount one drinks, the greater the risk).
- Alcohol increases the risk of liver cancer exponentially and is also closely associated to the risk of primary liver cancer, although the relationship be more difficult to demonstrate in the epidemiological studies, given that most of the alcohol-related liver cancers are consecutive to a cirrhotic degeneration which may have been induced, in turn, by the alcoholism, and this cirrhosis may have led an individual to reduce their alcohol intake. In the case of breast cancer, the risk is dose-dependent.

The average high, sustained volume of alcohol is more important in this relationship than the pattern of intake, which does not seem to play a major role in the etiology of this cancer.

The relative risks of different malignant neoplasias having been analyzed, these risks differ in relation to different levels of alcohol intake (g/day) according to gender:

Alcohol Intake (g/day)

Malignant Neoplasias	Males			Females		
	<39 g	40-59 g	60 y + g	<19 g	20-39 g	40 y + g
Bucal cavity and oropharyngeal cancer	1.5	1.9	5.4	1.5	2.0	5.4
Esophageal cancer	1.8	2.4	4.4	1.8	2.4	4.4
Laryngeal cancer	1.8	3.9	4.9	1.8	3.9	4.9
Liver cancer	1.5	3.0	3.6	1.5	3.0	3.6
Breast cancer				1.1	1.4	1.6
Other neoplasias	1.1	1.3	1.7	1.1	1.3	1.7

(Anderson P., Baumberg B., 2006)

Strategies for preventing and combating problems stemming from alcohol intake

Prevention is currently taken as being a wide range of universal selective and indicated measures which tie in with one another without any solution for continuity:

- Universal prevention: targeting the entire population; with measures addressing the individual, the agent and the environment (educational programs, legal measures, taxes, regulation of manufacture, sale, distribution and marketing, etc.)

- Selective prevention: targeting populations with a high probability of incurring in risk, focused mainly on measures which have an impact on the environment (responsible dispensing, public transportation, etc.).
- Indicated prevention: Targeting mainly individuals at risk. Those interventions which have shown themselves to be more cost-effective are screening and brief intervention.

Based on all of the above, it can be seen that there is no starring measure to deal with the problems related to alcohol intake, but that this entire intervention strategy is encompassed within an overall, comprehensive, multisectorial strategy, precisely as stated in the "European Alcohol Charter". Reducing the availability, the demand and the limiting of alcoholic beverage advertising continue to be the cornerstones of the main preventive actions taken through the Central Government Administration and the Autonomous Communities.

Lastly, as European reference points, we must point out, due to the importance thereof, the existence of the second European Plan for Action on Alcohol 2000-2005 of the WHO Regional Office for Europe; the Council Recommendation of June 5, 2001 on Drinking on the part of young people, particularly children and adolescents and the European Code Against Cancer. The framework of reference for the implementation of measures and policies at the national level is currently the European Union strategy for supporting the Member States in reducing alcohol-related harm (COM 2006).

Situation in Spain

According to Spain's National Health Survey for 2006, a total of 48.4% of Spain's population age 16 and above reports having regularly drunk some amount of alcohol. In 2001, the percentage of non-drinkers in Spain was 37%, having declined to 26% in 2006.

Drinking is more widely extended among males than among females, at-risk drinking being estimated at 7% in males and 3% in females.

Another fact to be highlighted is the information furnished by the latest Household Survey on Alcohol and Drugs in Spain (EDADES 2007/2008). Experience with alcohol is almost universal in Spanish society (88% of the population within the 15-64 age range have drunk alcohol at some time).

Environmental Factors

This general heading is aimed at grouping together a number of agents of varying degrees of far-reaching importance in relation to cancer and the type of exposure (occupational, environmental, iatrogenic), but which all share a number of characteristics:

- They are recognized as being of outstanding importance despite the knowledge about them being spotty regarding both their mechanisms of action and interrelations as well as their epidemiological mechanisms.

- Their study methodology entails specific difficulties, adding further to their complexity. For example, an environmental pollutant may be harmful once it is included in the diet (dioxins) or mediated by way of a hormonal stimulus (endocrine disruptors).
- Occasionally, these agents may increase the incidence of tumors considered as being emerging tumors (melanomas, Germ cell tumors, leukemias and lymphomas or brain tumors) having a higher incidence rate among younger people.
- Except for exposure to the sun, which is undoubtedly the factor for which the repercussions are most well-known and avoidable, controlling its incidence in the carcinogenesis process requires much more legislative actions and regulations than changes in the individual behavior of individual persons and generally requires coordinating among different instances and administrations.
- In designing of these regulations and laws, adopting the precautionary principle more than the risk principle seems preeminent.

Environmental control strategies. Situation in Spain

Growing social concern has made the environmental problem into a powerful argument in favor of developing an extensive European regulation which has recently been set out in a European Environment and Health Strategy, also known as the SCALE Initiative, with the aim of "developing a Community system which will integrate all of the information of the status of the environment, the ecosystem and human health" (COM, 2003).

Contamination of the occupational type (evaluated in the CAREX project within the Europe Against Cancer Program (Kauppinen, 1998) more often found to exist in our environment is that which is due to the sun's rays, second-hand tobacco smoke and silica (Maqueda-Blasco, 1998) for which specific prevention regulations are already in place.

Solar radiation and exposure to ultraviolet rays have merited special consideration, given their relationship to developing skin tumors and our own particular geographic location. Additionally, the frequency of skin tumors (melanomas and non-melanomas) has doubled over the past ten years in all EU countries, related to the increased exposure to the sun. Squamous cell tumors are closely related to the cumulative effect of prolonged exposures, being more frequent among people who work out in the sun. Basal cell tumors and melanomas are related more to intermittent exposures and a history of repeated sunburns. Based on the European Code proper, the different administrations and scientific societies have set out strategies for disseminating the preventive measures aimed at reducing total exposure time – particularly in young children- as well as the use of sunscreens.

The cancer-causing role of some viruses has been known since the beginning of the century. Some viruses for which substantial evidence of a causal relationship has been found are: HTLV-1 (adult T9-cell leukemia), HBV, HCV (liver cancer), Epstein-Barr virus (Burkett's lymphoma, Hodgkin's lymphomas and nasopharyngeal cancer) and papillomavirus (types 16/18 being those most related to cervical cancer). In our environment, the hepatitis B vaccine is included in the childhood vaccination schedule, which covers more than 95% of the population. The percentage which can be attributed to hepatitis B virus totals 20% of all liver cancers (60% attributable to HCV) (Bosch, 2000). Lastly, some regions of Spain where intensive farming has been highly-developed are of special interest in the toxicological and healthcare study of contamination by chemical agents and endocrine disruptors (Olea et al., 2002).

The Europe Against Cancer Program (EC 96/646) and the subsequent expansion thereon is a find driving force for the cancer control initiatives, specifically for the primary prevention strategies to meet with the merited dissemination and consideration. The European Code Against Cancer, which has recently been revised (Boyle et al., 2003), includes the best-documented recommendations at this time concerning primary prevention and must continue being a reference point for all those strategies which are designed based on the different Cancer Strategies.

Skin Cancer Prevention

Skin cancer is the most frequent of all the types of cancer. Of all skin cancers, melanoma is the cancer entailing the highest risk for the patients' health.

Although everyone is exposed to having skin cancer, there are some personal traits and characteristics of their exposure to environmental factors which place them at a greater risk.

The risk factors which must mainly be considered include:

- Overexposure to the sun. Ultraviolet radiation is the most important carcinogen in developing melanoma, this being a particularly important factor during childhood.
- Artificial tanning increases the risk and the incidence of having melanoma.
- Sunburns
- Fair skin (although having dark or black skin is no guarantee regarding melanoma).
- A family history
- A large number of moles.

The larger the number of risk factors a person has, the greater risk they will have of developing a melanoma.

The preventive strategies must mainly be focused on:

1. Avoiding excessive exposure to the sun by means of a set of measures which will change the less than healthy habits of the population (primary prevention). In the case at hand, the most important measures are:

- Avoid exposure to the sun from 12 noon to 3 p.m.
- Apply sunscreens 15 minutes prior to exposure, using a high sunscreen index, depending on the skin phototype. The sunscreen must be applied again as often as appropriate.
- Do not use the sunscreen for the purpose of lengthening the time you are exposed to the sun.
- Wear sunglasses, a hat and suitable clothing, especially in young children, as well as beach umbrellas and sunshades.
- Do not expose babies to the sun. During childhood and adolescence, it is highly important to employ these primary prevention measures.
- The reflection of the sun's rays on the sea, sand and snow must be taken into account.
- Special situations: More prevention must be used in those areas of the skin where there is any previous damage, scaring or burns. Also whilst taking some drugs (corticoids, immunosuppressants…)

Early detection by means of examining one's own skin regularly once a month or at least every two months using a mirror or with the help of someone else to identify whatever changes may take place. In this self-examination, the ABCD Melanoma method must be used.

- A: Asymmetrical
- B: Borders (outer edges) which are irregular
- C: Color. Melanomas frequently have two or more shades of color
- D: Diameter. They usually have a diameter of >6 mm

If you have even the slightest doubt, you should see your dermatologist for the respective diagnosis.

European Code Against Cancer Recommendations in Primary Prevention Recommendations

If you adopt a healthy lifestyle, you can prevent certain types of cancer and improve your overall health:

- Do not smoke. If you do smoke, quit as soon as possible. If you cannot quit smoking, never smoke in the presence of non-smokers.
- Avoid obesity.
- Do some moderate physical activity every day.

- Eat more fruit, green leafy vegetables and varied garden produce. Eat at least five servings a day (a single serving of fruit is 120-200 g raw and peeled). Limit your intake of foods containing animal fats.
- If you drink alcohol – whether it be wine, beer or hard liquor – moderate the amount to a maximum of two drinks or units daily if you are a male and to one a day if you are a female.
- Avoid overexposure to the sun. It is especially important to safeguard children and adolescents. Those people who have a tendency to sunburn must protect themselves from the sun throughout their entire lives.
- Strictly enforce the legislation intended to prevent any exposure to possible cancer-causing substances. Fully comply with all of the health and safety recommendations concerning the use of these substances. Follow the radiological protection standards.

Most of the aforementioned actions, as well as those to be reviewed in following have a bearing not only on regulatory and public health measures, but also on changes in individual habits.

In all of these strategies, it is necessary to have proper coordination with the media as well as with those entities of other organized civil society which carry out measures aimed at informing and raising the awareness of the population concerning health living habits. The necessary efforts must be made so that the measures and recommendations will reach all citizens by way of clear, pertinent messages.

1.4.2. Early Detection

Breast Cancer

Despite certain controversies, the findings of the case-control studies and clinical trials conducted to date are consistent. Most of these studies and trials have found taking regular mammograms to be conducive to a lower risk of dying due to breast cancer (AETS: Mammogram-based population screening for breast cancer, 1995) (Sankila et al., on breast cancer by mammogram, 1995), (Sankila et al., 129, 2000), (AETS: Evaluation Report No. 36, 2002), (IARC: Breast Cancer Screening, 2002), (Curry et al., 2003), (Jöns, 2003), (Barton et al., 2005), (Gabe et al., 2005), (Fletcher, 2006), (Gotzsche et al., 2006), (DESCRIC, 2007).

Regarding the effectiveness of screening in women under 50 years of age, the controversy is ongoing regarding its effectiveness as regards achieving a significant reduction in the mortality rate for this age group. The evidence shows a decline in the mortality rate of females within the 40-49 age range, the results of the meta-analysis however not being significant, and the magnitude of the effect is less than in the group of females age 50 or older.

Additionally, it is suggested that the percentage of females in the 40-49 age group in which the risk of the mammogram outweighs the benefits is higher in the group of females age 50 or older and could be clinically significant (Armstrong et al., 2007), (Humphrey et al., 2002), (Deck eta al., 2006), Moss et al., 2006).

What there is a general consensus about is the recommendation of implementing, on a population-wide basis, breast cancer screening programs for all females within the 50-69 age range (Canadian Task Force on Preventive Health Care, 2002), (US Preventive Services Task Force, 2002), (National Health Service, 2003), (EC Commission, 2003), (Cierco, 2003), (Boyle, 2003-European Code Against Cancer), (European Parliament Resolution, 2003).

Regarding the screening tests studies, there is a majority agreement to use mammograms as the only test. Combining mammograms with a physical examination – although possibly heightening the sensitivity of the process – does not manage to reduce mortality to any greater extent.

Nowadays, digital mammograms are being suggested as an alternative to conventional mammograms as a screening test. Although there do not seem to be any significant differences between the two in the breast cancer detection rate in the populations screening as a whole, the results of the evaluations made indicate a greater degree of accuracy in the diagnosis of cancer in females under 50 years of age, females with dense mammary glands and pre or perimenopausal females (Pisano et al., 2005), (Skaane et al., 2005), (Hailey 2006).

As regards the breast self-examination, there is reasonable evidence as to there being no benefit and good evidence of harm, as a result of which this practice should not be recommended (Baxter, 2001).

The fourth edition of the "European guideline for quality assurance in mammography published in 2006 shows the recommendations and standards to be achieved in the different aspects comprising a breast cancer screening program (the mammography technique, radiographic and radiological aspects, anatomopatholody, surgical treatment, evaluation and training) (Perry et al., 2006) so that it will really be effective and actually achieve a significant reduction of mortality.

The first breast cancer screening program was started up in 1990. Since then, population-based programs have progressively been implemented in all of the Autonomous Communities, such that there is practically full coverage nationwide at this time. All of these programs are related in a network, Spain's Cancer Screening Program Network, in which protocols and guidelines for taking action as well as evaluation indicators are discussed and proposed, following the recommendations set out in the European mammography screening quality control manual.

It is necessary to make special mention of the genetic factors related to this disease (AETS: Evaluation Report No. 32, 2002). It is calculated that 5% of all breast cancers are hereditary, and in females below 45 years of age, up to 15%. The genes which are currently associated with genetic predisposition for breast cancer are BRCA1 and BRCA 2, although it is suspected that others as yet unidentified must exist. The detection or suspicion of alterations existing in these genes makes it possible to identify females who are carriers of a mutation with a predisposition to have breast and/or ovarian cancer and also of individuals at risk who could benefit from specific preventive monitoring or treatment strategies. However, solely if a pathological mutation is detected in the family should the analysis be conducted on other members (Ruano, 2002).

Cervical Cancer

The effectiveness of cervical cancer screening has never been studied by way of random clinical trials. However, the case-control cohort studies and the analysis of trends and geographical differences have shown that pap smears (Papanicolau) taken every 3-5 years are effective for reducing the incidence and mortality rates due to this tumor (Boyle et al., 2003-European Code Against Cancer), (Avalia-t: Cervical cancer screening, 2002), (Sankila et al., 2000).

According to the studies conducted in countries with incidence rates similar to Spain, the period of protection following a pap test with a truly negative results would be up to ten (10) years, which would leave a margin for setting a five-year period interval tests and never less than three years (Vikki et al., 1999), (Sawaya et al., 2003).

Most of the recommendations regarding the age at which it is advisable to begin using the screening tests are based on studies on the prevalence of harm at different ages and on the association between sexual activity and cervical cancer, as a result of which the trend is toward recommending early ages or coinciding with the start of sexual relations for beginning this screening. However, based on the protection which the screening tests provides if there is a true negative result, the maximum performance would apparently be achieved by starting 5-10 years prior to the age of maximum incidence (age 25-35) and to continue up to 55-60 years of age (Avalia-t: Cervical cancer screening, 2002).

An overall consensus also exists in this case for recommending population screening programs to be started up (Canadian Task Force on Preventive Health Care, 2002), (National Health Service, 2003), (European Commission, 2003), (Boyle et al., 2003-European Code Against Cancer), (Curry et al., 2003). According to the Council Recommendations on cancer screening from the European Communities Commission (European Parliament

Resolution, 2003) the Papanicolau test (pap smear) should be used as the screening test, which must start at age 30 at the latest and never any earlier than age 20, with 3 to 5-year intervals between these tests.

Although the general recommendation applicable to screening tests is for these tests to be conducted within the framework of organized populated-based programs, on must take into account the specific situation at this time in our country with its low degree of this type of cancer (low incidence rate of cancer and low prevalence of humanpapilloma virus infection) and widespread conducting of screening in an opportunist manner (DESCRIC 2007).

The impact of screening of this type of populations is unknown, but from the individual standpoint would make it possible to detect precursor lesions and would provide for early cancer detection, provided that some minimum standards of quality were met.

In this regard, just as in the case of breast cancer, European guides have been published with the recommendations with which the entire cervical cancer screening program must comply (Arbyn et al., 2008).

To improve the effectiveness of this screening, new screening techniques based on conventional cytology or HPV detection as a necessary past history for developing cervical cancer. The fluid-phase cytology could mean a significant breakthrough over the conventional Papanicolau technique, given that the sample analyzed is more highly representative, the possibility of automating its reading, the major reduction of ambiguous results and the greater sensitivity for high-degree lesions. Viral detection has also been evaluated as a primary screening test, with cytology or biopsy as a secondary test for confirming the lesion.

The International Agency for Research of Cancer evaluated the evidence published concerning cervical cancer screening up to February 2004, having come to the conclusion that both the fluid-phase cytology and the automated reading of the slides and the HPV DNA detection are each suitable techniques for the primary screening process, their performance being at least as satisfactory as conventional cytology (IARC Monograph, 2005).

HPV vaccination having been recently added into the vaccination Schedule will make it necessary, on a mid-range basis, to reconsider the screening recommendations in accordance with the findings thereof (IARC Monograph, 2005).

Colorectal Cancer

The clinical trials conducted for evaluating the efficacy of colorectal screening by means of fecal occult blood test reveal lowered mortality rate for this tumor. This reduction was consistent in the four controlled trials (Minnesota, Nottingan, Funen and Goteborg), ranging from 15% to 33% (Sankila et al., 2000), (Avalia-t: Evaluation of the efficacy and effectiveness of population-based colorectal cancer screening, 2003), (Walsh et al., 2003), (Hewitson et al., 2008).

Based on the evidence found, the best strategy supported for conducting population-based screening would be that of the fecal occult blood test (Avalia-t: Evaluation of the efficacy and effectiveness of population-based colorectal cancer screening, 2003), (Launoy et al. 2005), (Guittet et al., 2006), (Fraser et al., 2006). However, the sensitivity is limited (not exceeding 50%), and the positive predictive value is low (10%-18% for the diagnosis of cancer and 21%-38% for the diagnosis of adenomas larger than 10mm). Additionally, colonoscopy (test for confirming diagnosis for the study of positive cases) is a test involving a certain degree of complexity requiring a large number of resources and which entails a considerable associated risk of complications.

Other strategies, such as the flexible sigmoidoscope and the colonoscope employed with different regularity are being evaluated as alternative methods to screening (UK Flexible Sigmoidoscopy Screening Trial Investigators, 2002), (Segnan et al., 2002), (Weissfeld et al., 2005). Based on the results of the evaluations conducted to date of virtual colonoscopy, this technique cannot be recommended as a screening technique for the time being (NICE; 2005), (MAS, 2003).

Combining various screening techniques has not shown itself to achieve any greater reduction in colorectal incidence and mortality rates as compared to any one single modality (DESCRIC, 2007).

Different organizations are actively recommending starting up this type of screening. The suitable age range would be the 50-74 age range and would use fecal occult blood testing the screening test to be conducted every two years (Canadian Task Force on Preventive Health Care, 2002), (National Health Service, 2003), (European Union Commission, 2003), (Boyle et al., 2003-European Code Against Cancer).

A population screening program for colorectal cancer is a complex project requiring studies to evaluate the suitability of starting up such a program and, once this decision has been made, of a major organizational task for implementing the program.

One of the main problems in any screening program is getting the target population to take part in the program, it being essential for the program to meet with a high degree of acceptance in order to assure the benefit in terms of cost-effectiveness.

The findings to date in clinical trials do not necessarily mean any guarantee of effectiveness of any certain population program if factors including that of a high degree of participation are not achieved.

One must bear in mind that it is necessary to identify individuals/families at risk of a syndrome of hereditary predisposition for colorectal cancer who may benefit from genetic counseling and preventive strategies or from monitoring and specific treatments.

Prostate Cancer
No studies proving the efficacy of screening for this tumor are currently available. Screening by way of a digital rectal examination, transurethral echography or a specific prostate antigen assay have not proven themselves to reduce the mortality rate. Two randomized clinical trials are currently under way, the European Randomized Study of Prostate Cancer (ERSPC) (Schröder, Bangma, 1997), (Vis et al., 2000) and the PLCO (Prostate, Lung, Colon, Ovary) trial of the National Cancer Institute de EE.UU. (Prorok et al., 2000), but their preliminary findings recently published are difficult to assess. Whilst the former of the two concludes that it is possible to achieve an approximate 20% reduction in the mortality rate, although associated with a high rate of overdiagnosis and there must be evaluated (Schröeder et al., 2009), the latter finds no significant differences in the mortality rate in the two study groups following 10 years of monitoring (Andriole et al., 2009).

The systematic application of the specific prostatic antigen assay in asymptomatic males entails a great number of false positive results and false negatives with the resulting secondary effects these results cause. Additionally, the decision to justify a population screening turns out to be complicated on not availing of clinical trials which have evaluated the efficacy of the prostate cancer treatment in localized lesions.

In conclusion, it is not recommended that any prostate cancer screening program – whether population or individual screening- be used in asymptomatic males. Nevertheless, special mention must be made of the fact that this test is being conducted progressively more often without any indication whatsoever, it therefore being recommended to inform the healthcare professionals and the population as to the current status of the scientific evidence in this regard.

1.4.3. Adult care

Treating cancer in adults normally requires employing the following treatment strategies: surgery, chemotherapy, radiation therapy, hormone therapy and the biological response modifiers. In fact, the need of coordinating the contribution of the different specialists in cancer treatments is one of the specific challenges involved in organizing cancer care and, in conjunction with the active involvement of different care-providing levels in the treatment and follow-up of most patients, determines a good part of the organizational complexity of planning and evaluating clinical results in oncology.

Along with the unique aspect of cancer care, one must bear in mind that the existence of a remarkable degree of variability in the clinical results in Europe has been documents, as can be seen in the survival data obtained in the population-based cancer registries, which are one of the best indicators of the clinical results achieved in our patients. The EUROCARE project makes it possible to compared the data from different European countries using the same analysis methodology (Coebergh et al, 1998).The most recent data, published in 2009 within the framework of the EUROCARE IV project, make it possible to establish that the survival in the adults with cancer included in Spain's registries is in an upper intermediate position within the European context (Karim-Kos, 2008; Sant et al., 2009). For example, the overall survival rate for both genders in Spain's cancer registries at five years following diagnosis and in the patients diagnosed within the 1995-1999 period were of 49.3% in both genders together, whilst the countries with better European data were Sweden (58.3%) and Austria (56.1%), whilst the countries with lower percentages were Poland (38.6%) and Slovenia (41.5%), the European average being 50.3%). These results must be taken with due precaution, due to the fact that Spain's registries included in this study do not represent Spain's entire population, and one part of the differences in survival are due to the combination of tumors, which differs from one country to another. The survival rate found indicates that cancer care in Spain is on the European average, but there is clearly room for noticeable improvement in many tumors and in cancer as a whole, especially in aspects regarding organization and resources for treating cancer.

Conducting cancer research affords the possibility of assuming that new treatments will be added based on a better knowledge of the molecular biology of cancer, which has been witness to numerous scientific breakthroughs over the past few years which may significantly modify the efficacy of the current treatments (DeVita et al., 2001).

Therefore, all strategies for combating cancer must have as an essential component that of promoting cancer research, applied both to the realm of therapies as well as to that of the organization of the healthcare services which may more optimally be able to diagnose and treat cancer patients.

The way in which cancer care has been provided in Spain has been determined by the difficulty of devising, within the traditional organizational structure of the hospital care services, the multidisciplinary concept of cancer care based on the needs of the diagnostic and treatment process of cancer patients.

Another aspect similarly worthy of special mentions if the different pace at which cancer care is provided from one medical specialty to another and from one Autonomous Community to another which has been noted over the last twenty years, precisely as has been put forth in the different editions of the White paper on cancer in Spain published by the Federation of Spanish Oncology Societies (FESEO, 1988, 1994 and 2002), the Spanish Medical Oncology Society (SEOM, 2005) and the Spanish Radiation Therapy Oncology Society (SEOR, 2009).

In synthesis, the main problems detected may be listed as follows:

- Cancer care being provided in a piecemeal manner among the different hospital services and centers and lacking a significant degree of connection among the levels of care involved in the cancer diagnosis, treatment and monitoring process. These problems concerning the relationship among care-providing levels may explain a major part of the delays in cancer diagnoses (Porta et al, 2003), (Pérez et al., 2008).
- Territorial inequality among and within the Autonomous Communities with regard to accessing the specialized resources necessary for offering quality cancer care.
- Total lack of a cancer care coordination-organization model among the hospitals of different care levels and within the hospitals proper. This has led to there being hospitals at which the cancer treatment may vary depending upon the specialist or the healthcare service with the same territory in which the diagnosis has been made.
- Significant variability in the clinical practice of cancer therapy from one professional to another, from one hospital to another and from one territorial area to another, which may result in differences in the clinical results (Peris et al., 2001, Pla, 2004).
- Significant waiting lists in different diagnostic and treatment procedures.
- Paces of updating radiation therapy equipment which, in certain territories and at certain times, may lead to less than optimum radiation therapy being used and, in some cases, waiting lists. (Escó et al., 2003).
- Deficit of healthcare professionals assigned specifically to cancer care.
- Lack of definition of criteria for specialization in complex procedures and/or low frequency procedures which may make it possible to achieve greater treatment efficacy. Examples of the highly complex procedures which would be advisable to evaluated where they may be carried out with better outcomes are surgery for curative purposes of esophageal, pancreatic, rectal, lung cancer or neuro-oncology surgery, as well as liver metastasis. In the non-surgical areas, mention may be made of the transplants of hemopoietic progenitors or some radiation therapy techniques.
- Highly limited resources devoted to psychosocial care and to rehabilitation. Insufficient attention given to the problems of nutrition

in the patients diagnosed with cancer, to those which entail some adverse effects of the treatment and in advanced cancer.

- Development of care-providing protocols and clinical guides, limited to the main tumors and varying to a certain degree from one Autonomous Community to another in the recommendations.
- Relationship between research and clinical practice focused on conducting clinical trials at hospitals, health research institutes, universities or Higher Council of Scientific Research (CSIC).
- Insufficient evaluation of clinical results of the diagnostic and treatment procedures, given that solely in some cases has information been available on the care-providing process (i.e. time lapse between treatments).
- Very little involvement of the patients and their family members in managing their own process. Informing patients and patients being actively involved in choosing the treatment alternatives are as yet limited.

It must be pointed out that, over the past few years, some significant changes have been made for the purpose of changing this situation: Some of the most noteworthy advancements made over the last ten years are:

1. The effort made in investing in radiation equipment, which has meant some significant advancements regarding both what this means with regard to updating equipment and updated technologies as well as with regard to territorial equity.
2. The progressive expansion of oncologists to intermediate-level and regional hospitals with the improvement this means in accessibility and the possibility of forming tumor committees at these hospitals (Borrás et al., 2009).
3. Implementation of new diagnostic methods, drugs and treatment strategies which are more effective despite their higher economic cost.
4. The technical debate as to the degree of centralization or concentration of healthcare resources which are required for the proper diagnosis and treatment of cancer has not as yet been resolved (Hillner et al., 2000), (Smith et al., 2003), (Coleman et al., 2008), given the complexity of related factors.
5. More highly complex treatments requiring multidisciplinary integration of the professionals and which increase the need for coordination, such as the combination of pre-operative radiation therapy and chemotherapy,etc. (Choy, 2003). The scientific evidence as to the improvement of clinical results associated with multidisciplinary care reveals the importance of considering this to be a key aspect of the cancer care model (Fleissig et al., 2006), (Wright et al., 2007).

6. The significant degree to which clinical and preclinical research are being delved into deeper, especially by way of the activity connected to the cancer research networks funded through the Carlos III Health Institute (ISCIII).
7. The connection progressively being formed between applied research and clinical research facilitated by the cooperative research networks (Wolf, 2008).
8. The positive changes in the knowledge of and attitude toward cancer on the part of the population, thus determining their being more demands and also better accepting the treatments (Izquierdo et al., 1996), (Jovell, 2008).
9. A greater implication on the part of society. One example being the progressive development of mutual help groups and volunteering.
10. Cancer plans being set out in different Autonomous Communities out of their willingness to address a specific care model for the organization of the diagnosis and treatment of cancer along the line of the suggestions which are being carried out in most European countries (Guveia et al., 2008).

The care-providing objectives in the diagnosis and treatment of cancer in adults are detailed in the following sections and a number of recommendations made for moving ahead in improving cancer care in adult patients.

1.4.4. Child and Adolescent care

In Spain, approximately 1,400 children and adolescents are diagnosed with cancer every year. A severe disease more curable by the day which requires a complex and at times long treatment in a child's life. A disease which has a determining effect on the personal and social structure of a family. The Cancer Strategy must therefore be approached from the very start with integral care provided for the child and their family and social environment.

Today in Spain, one out of every 2,000 adults is a survivor of childhood cancer. Therefore, the objective of pediatric oncology can be no other than achieving that the child cured of a cancer will reach adulthood capable of living a normal live from the physical, psychological and social standpoint, an adult with the same rights and obligations as their peers who did not become ill.

In this regard, it is important to know that adolescents with cancer pose a number of specific problems stemming from the fact of being seriously ill at a time in their lives when a human being most fights for their independence and self-dependence. Adolescents are, in this situation, more dependent on their parents, and this disease brings their intellectual, sports-related and social ambitions in life to a screeching halt. Therefore, it is recommended that the care for adolescents be provided in pediatric oncology units which have the necessary psychosocial care infrastructure and include schooling.

The care provided for children diagnosed with cancer must be provided in the hospital environment, in a Pediatric Oncology Unit, in which the medical and specialized nursing staff guarantees the integral care of the patients and their families. The complexity and specificity of the treatment so require. The survival and the quality of life of these children depend on facts as basic as this.

The Pediatric Oncology Unit must be integrated into a Pediatrics Department, working in coordination with all of the other pediatric specialties and hospital departments. The requirements of a Pediatric Oncology Unit have been established and recently updates by the International Society of Pediatric Oncology (Thaxter G Et al., 2002 and 2009) and are specified in following.

The International Society of Pediatric Oncology (SIOP) Recommendations for Organizing a Pediatric Oncology Unit

Every child and adolescent who has cancer must have access to a diagnosis, treatment and follow-up by a multidisciplinary pediatric team in which there is coordination with pediatricians, pediatric oncologists, pediatric surgeons and radiation therapy oncologists. Special attention must be given to adolescents and young adults.

- The Pediatric Oncology Unit must function integrated into a national and/or international organization so as to facilitate communication and coordination of the new treatment methods and research. There must be material and human support for taking part in clinical trials and epidemiological registries on childhood cancer.
- The Pediatric Oncology Unit must provide treatment to a sufficient number of patients to guarantee an infrastructure which includes:
  - Pediatric surgery
  - Radiation therapy oncology
  - Pediatric intensive care
  - Anatomopathology
  - Treatment with nutritional, psychosocial and rehabilitation support

  These units must be in a hospital or in the near vicinity of a hospital.
- The operating scheme of the Pediatric Oncology Unit is:
  Hospitalization area capable of providing the following:
  - Complex medical treatment and central venous access via
  - Monitoring long-range drug infusions
  - Caring for seriously ill, immunodepressed or terminal stage children
  - Handling and preparing chemotherapy

  - Completing the clinical record
  - Providing accommodations for the parents in the Unit or in the nearby vicinity
  - Providing psychosocial and spiritual support

  Day hospital
  - Outpatient chemotherapy treatments
  - Outpatient support treatments (transfusions, antiemetic and fluid therapy treatments)
  - Clinical observation of patients for a few hours' time

  Consultation
  - Follow-up on patients
  - Fast access to laboratory and radiology
- Necessary human and technical means:
  - Nurses holding credentials in Pediatric Oncology
  - Child Radiology Service including CAT, MR, echography, angiography, etc.
  - Laboratory equipped for tumor markers and drug monitoring
  - Hemotherapy
  - Pharmacy familiarized with the use of chemotherapy. Laminar flow bell. Availability of parenteral nutrition techniques.
- Pediatric Tumor Committee
- The Pediatric Oncology Unit must assure round the clock operation (hospitalization).
- The Pediatric Oncology Unit must assure the continuing training of its professionals.

The International Society of Pediatric Oncology (SIOP) recommended that a pediatric oncology unit should treat a certain number of new patients per year, which ranges from 30 to 50 new patients per year in order to be able to have sufficient experience.

It is additionally important to further expand upon the collaboration with primary care and regional hospitals so that, by joining forces, these children will not have to travel to the large hospitals for all the studies and treatments. This involves defining the role which providing care for child and adolescent cancer patients plays at the different levels of hospital care-providing complexity and developing a plan for coordinating among all of them.

Three levels of care can be determined for children and adolescents who have cancer:

Level 1: Comprised of primary care pediatricians and regional hospitals which, in very specific situations, may provide care for these patients, always coordinated with their reference Pediatric Oncology Unit.

Level 2: Pediatric Oncology Units located in Pediatric Services/Areas with the infrastructure established by the International Society of Pediatric Oncology (SIOP).

Level 3: Pediatric Oncology Units which additionally avail of highly specific treatment options (i.e. transplants of bone marrow progenitors from non-familial donors or certain neurosurgery, trauma surgery or radiation therapy techniques.

The Level 2 Units refer patients for a certain treatment to these Level 3 reference Units.

Childhood cancer is a chronic disease which often causes major medium and long-range physical and psychological sequelae. Providing psychosocial care for these children and their families from the very point in time of the diagnosis coordinated with the medical care aids toward a better tolerance of the treatment and mitigates the sequelae thereof. Therefore, the assistance for schooling, social needs, psychological support etc. must be taken into account within the framework of their integral care. Additionally, healthcare and social follow-up on the survivors is necessary, as also is the follow-up and support of the families who have lost a child to cancer.

Spain is one of the European countries in which the health care provided for children diagnosed with cancer is good overall. Starting up national protocols coordinated by the Spanish Society of Pediatric Hematology and Oncology (SEHOP) and the Spanish Hematology Society (SEHP) with the collaboration therein in international protocols, has been a determining factor in the survival rate for children diagnosed with cancer in Spain being similar to that of the countries in our surrounding environment, which is approximately 76.1%.

The National Childhood Tumor Registry (RNTI-SEHOP) survival rate data so confirm: relative survival rate for all tumors at 5 years is 78% (Peris R et al., 2009).

The need must be stressed of improving the preferential medical care circuits in view of a childhood being suspected on a well-founded basis and on the continuing training of the family physicians and pediatricians concerning pediatric oncology, which, although infrequent, is the second-ranked cause of death among children ages 0-14 in Spain.

Clinical, basic and epidemiological research in pediatric oncology must be coordinated among this country's different pediatric oncohematology units by means of taking part in the theme-based cancer research networks. The molecular diagnosis of leukemias and solid pediatric tumors afford the possibility of defining prognosis factors and the patient's personalized treatment.

The study of the predisposing factors for developing a childhood cancer is a subject of top interest. Leaving aside the familial cancer syndromes which total solely 4%-10% of the cases (Knudson AG, 2003), the risk factor research is focused on environmental factors. Recently, the European Commission set out in its "Environment and Health" Strategy (Brussels, June 11, 2003) one of the main priorities in the contents of its first cycle (2004-2010) as being the improvement of the understanding of the relationship among different environmental factors and childhood cancer. In this regard, there are publications which make reference to a rise in the incidence rate of childhood cancer associated to preconceptional, conceptional, transplacental and postnatal exposures (Smith MA, Gloecker LA, 2002), (Doyle P et al., 1998).

Lastly, all of the care provided for children diagnosed with cancer must be governed by bioethical criteria which safeguard their dignity and their quality of life from diagnosis to they are cured or until their death.

1.4.5. Palliative care

The advanced and terminal stages of cancer cause intense suffering for patients and their families and also in the healthcare professional responsible for their care. There is a great need and demand for care related to the following profile (Palliative Care Quality Criteria Guide, 2002):

- Advanced, incurable, progressive illness
- Little ability to respond to the antitumor treatment
- Evolution of mood swings and frequent crises of need
- Intense emotional and family impact
- Repercussions on the care structure
- Limited prognosis of living

For different reasons, some of the most prominent of which are the scant degree of training in palliative medicine and a deficient consideration of the many different repercussions this disease has on an individual in the medical field today, the standard care dispensed to these patients is often inappropriate and insufficient, with the resulting unnecessary suffering on the part of many individuals (Von Röen et al., 1993; Cleeland et al., 1994; Addington-Hill and Mc Carthy, 1995; SUPPORT, 1995; Gómez, 1998; Pascual., 1999). In view of this situation, there is a widespread demand for human being-focused care of reasonable quality and costs which will make a dignified life and death possible (Singer et al., 1999). Palliative care is aimed at providing a professional, scientific and human response to the needs of these patients and their family members from a biopsychosocial dynamic.

The World Health Organization (WHO, Sepúlveda et al., 2002) defines palliative care as "an approach which improves the quality of life of patients and their families facing the problem associated with life-threatening illness through the prevention and relief of the suffering by means of the early identification and impeccable evaluation and treatment of the pain and other problems, physical, psychological and spiritual".

Palliative care:

- provides relief from pain and other distressing symptoms;
- affirms life and regards dying as a normal process;
- intends neither to hasten or postpone death;
- integrates the psychological and spiritual aspects of patient care;
- offers a support system to help patients live as actively as possible until death;
- offers a support system to help the family cope during the patients illness and in their own bereavement;
- uses a team approach to address the needs of patients and their families, including bereavement counseling, if indicated;
- will enhance quality of life, and may also positively influence the course of illness;
- is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications.

This integral model of palliative care, originally based on the hospice movement teachings, has proven itself to be effective and efficiency and is the alternative treatment of choice in the advances and terminal situation (Hearn e Higginson, 1998; Gómez Batiste, 2001; Gómez Batiste et al., 2002).

A modern concept of palliative care must consider the transversality of the treatment measures throughout the curse of the evolution of the illness, guaranteeing continuity in the care provided (ASCO, 1998; Ahmedzai y Walsh, 2000; Consensus Document SECPAL-SEMFYC, 2001; Valentín, 2003). Over the past few years, different publications have underlined the responsibility of the oncology teams in starting palliative treatment guidance and in the subsequent coordination with the different care level (Chemy y Catane, 1996; Catane, 1999; González Barón, 1996; Maltoni y Amadori, 2001).

Every patient in an advanced, terminal situation is entitled to palliative care. (National Palliative Care Plan, 2001). The guarantee of this right is a fundamental activity of cancer treatment and therefore a responsibility of the National Health System. Following the latest developments in modern bioethics and recent legislation (Patient Self-Dependence Law 42/2002), all palliative interventions must revolve around the patient proper, which is, a prioi, a self-dependent individual capable of making decisions concerning their own life.

The care-providing model (National Palliative Care Plan, 2001): must be integral (covering all of the physical, psychological, social and spiritual needs), must be integrated into the health system network, must be divided into sectors by healthcare districts, must be coordinated among the specialized and primary care levels and services, must be open to coordination with social resources and comprised of interdisciplinary teams. An ideal framework for this care-providing model applied to oncology is the multidisciplinary tumor committee.

The discussion regarding the list of services provided and the coordination must be based on the patient's needs. Each healthcare district should identify and boost its palliative care resources.

An ideal model include – in conjunction with a high degree of competence on the part of the specialists and primary care professionals – the presence of specific palliative care teams in acute care hospitals, at centers with a sociosanitary profile and also in home care.

1.4.6. Quality of life

Over the past few years, some major breakthroughs have been being made in the diagnosis and treatment of cancer which are giving rise to nearly 50% of the patients diagnosed currently being able to survive this illness and the rest to significantly improve their quality of life.

At the same time, scientific breakthroughs are also progressively being made in the study and treatment of cancer, some very important changes taking place both in the patients' clinical profile as well as in the treatment and care-providing aspects.

The scientific advancements made in the field of oncology, as well as their rapid dissemination in the general media are causing new adaptation-related problems for patients in the clinical environment whilst they are causing some major changes in the way in which the general population views the problems related to cancer.

The high incidence rate and mortality rate of this illness, the high rise in the survival rate as well as the greater amount of information currently available to society concerning cancer and its treatments has given rise to:

- An intense social awareness regarding this illness.
- Progressively greater demands being made by society in general and by the patients in particular concerning the quality of the care provided as well as the psychosocial, rehabilitation and social reinsertion-related needs which are created in regard to this illness and to cancer patients.

The term "quality of life" is taking on more importance by the day among patients, their evaluation being especially important in oncology for several reasons:

- There is no linear relationship among the seriousness, evolutions of the illness and the quality of life of all these patients, given that we know this to depend both on the objective medical factors as well as on the subjective and emotional factors of each patient.

- The psychological impact of the diagnosis for the patient and their family, given the prospects of the prognosis and treatment.
- The physical impact of this illness and of the treatments, due to both their acute as well as chronic adverse effects.
- The growing number of survivors of this illness and the progressively lengthening time of survival of those who do not progress favorably. Within this context, progressively greater importance must be placed on the evaluation of the needs of the long-term survivors, a realm about which little is known in our country (Zabora J, 2001).
- The desirable quality of life must be for physicians one of the determining aspects in choosing the type of treatment to use and one of the aspects regarding which the patient must be informed in the decision-making process.
- Special mention must be made of the quality of life in elderly cancer patients, in whom, given their physical and psychological frailty, this concept becomes of greater importance (Pasetto LM, 2007; Wedding U, 2007).

However, the first problem to be faced when dealing with quality of life is accurately defining this concept, given this it is difficult to define, given the complexity of the parameters involved therein and the major subjective aspect thereof. Currently, most authors agree regarding the multidimensionality and subjectivity of the quality of life concept and suggest that physical, functional, psychological, social/family and economic/employment wellbeing must be considered.

The individual and therefore subjective nature of quality of life (the aforementioned dimensions are not of the same degree of importance in all patients) as well as its dynamic nature (it may change in one same individual over the course of their lifetime) and the necessary multidimensional scope (Bloom JR, 2007) (encompassing various areas of their life) must all be considered. Nevertheless, a number of psychological, physical and social/employment-related aspects arise in a very large percentage of patients diagnosed with cancer which have a bearing on their quality of life (Berger AM, 2007; Jacobsen PB, 2008; Massie MJ, 2004).

A. Psychological aspects

Cancer is a complex, serious illness affecting all realms of a person's life (Massie MJ, 1989). This illness marks a break in the organization, pace and style of their lives and entails an emotional and psychological impact in its three dimensions: cognitive, emotional and behavioral. And this is not solely for the cancer patient proper, but also for their entire family and social environment. This occurs not only at the point in time of the diagnosis, but rather, to a different degree, throughout the entire oncological process, even years after the process has ended, becoming emotional sequelae thereof (Stein KD, 2008; Tanvetyanon T, 2007; Zabora J, 2001).

The psychological repercussions of this illness have a negative impact on both the quality of life at the time as well as on the ability to recover and adapt to this illness (Bottomley A, 2002; Catt S, 2008; Evan EE, 2006; Helms RL, 2008).

Scientific evidence shows more than 50% of the patients as having signs and symptoms of anxiety and depression as a result of the major degree of psychological distress they experience.

It has additionally been found that 20%-35% of cancer patients end up showing psychopathological morbidity following the diagnosis and that these percentages rise during the treatments and hospitalization. However, the recognition of psychological problems in cancer patients over the past few years has not gone along with any suitable psychological help being organized (Sheard T, 1999; Stark D, 2002).

Apart from the above, a diagnosis of cancer means an alteration of the family dynamic which requires a major degree of flexibility on the part of the different family members for the purpose of adapting as appropriately as possible to the demands generated by this illness and its treatments.

Scientific evidence exists supporting the positive effects of psychological interventions in the emotional adjustment to this illness and on the quality of life as well as in the prevention of the professional burnout syndrome. On the other hand, the healthcare professional may offer general emotional support in keeping with their skills and identify, by means of specific tools, those patients who are in need of specialized psycho-oncological care.

For all these reasons, it is considered advisable to include aspects of psycho-oncology in the teams for providing quality healthcare.

B. Physical aspects

Both this illness, especially some types of cancer in advanced stages, as well as the treatments administered in an attempt to achieve their cure or to lengthen the survival of these patients frequently entail sequelae or side effects of different degrees, generally of a temporary nature, but which may continue to exist in the long term and/or become permanent (Stein KD, 2008).

Surgical treatment sometimes entails some major physical sequelae. Therefore, over the past few years, for the purpose of improving functional and cosmetic aspects, organ conservation techniques and reconstruction of anatomic defects causes either by the tumor proper or by the treatments are being enhanced to the utmost.

Radiation therapy often entails side effects (xerostomy, radiation dermatitis, mucositis, etc.). Some of these effects may go so far as to be severe (necrosis, fibrosis, fistulas, myelitis, mutagenesis, etc.) thus significantly altering the quality of life of these patients (Frick E, 2007).

The secondary effects of chemotherapy (hematological, digestive, dermatological, cardiac, neurological, pulmonary, hepatic, renal toxicity, hypersensitivity,etc.) are one of the aspects most feared by cancer patients which also clearly alter their quality of life both during the treatment as well as on a mid-range and long-range basis (Costa-Requena G, 2009).

Within this scope, rehabilitation plays a highly important yet not always well-recognized role which must be enhanced within the framework of providing integral cancer care. Two areas which must be mentioned separately are the rehabilitation of lymphedema in breast cancer, the shortcomings of which have been recently documented (Wedding U, 2007) and the care and supervision of ostomies in colorectal cancer.

It would be necessary to make further progress with regard to integrating specialized professionals in the physical therapy field into the multidisciplinary cancer care teams as an aspect necessary for providing quality health care.

Lastly, one aspect which has been recognized over these years as being needed is that of the nutrition of cancer patients. The specific diet-related needs may be caused by the illness proper, by the adverse effects of the treatments or by the progression of the cancer. Special mention must be made of the fact that 60%-80% of the patients with advanced illness suffer from caquexia at some point in time of their evolution. Recently, a consensus document has been published concerning the nutritional interventions necessary in these patients, based on evidence, which takes in the different needs of these patients (J. Álvarez Hernández et al., 2008).

C. Social, employment-related and economic aspects

Both the physical as well as the psychological consequences of this illness may affect returning to regular life, especially to working life. Currently, some patients prefer to combine their working life with the treatment, although the majority must devote all their time to the treatment process.

Returning to working life depends to a great extent on the possible degree of recovery. Therefore, the rehabilitation process is essential and must include the functional and psychological aspects. All this must be taken into consideration in the treatment plan.

Also during the treatment, the patient may need the support of a family member whose devoting their time may involve limiting or temporarily leaving their regular working activity in order to be able to take care of the person who is ill.

Likewise, this illness usually entails a major repercussion on the family economy due to a loss of income (sick leave) and to increased expenses (transportation, meals outside of the home, need for private caregivers, etc.)

In short, so as to try to improve the quality of life of the patients diagnosed with cancer, we must employ an overall approach to the psychological adjustment or adaptation to the illness, to the treatments and to their side effects, as well as to the physical rehabilitation, social and employment-related rehabilitation and reinsertion of the patients diagnosed with cancer.

D. Quality of life of the healthcare professionals

In addition to the medical care of individuals who have chronic, serious or potentially life-threatening illnesses such as cancer, as well as coping daily with the physical deterioration involved, generate significant degrees of stress and emotional turmoil among the members of the healthcare staff, which not only alters the psychological well-being of the professional who is undergoing this stress and emotional turmoil but may also affect the care which is provided to the patient, the relations which the professional in question has with their fellow workers and also their relations with family and friends. The stress and feelings of impotence which caring for a cancer patient generates may lead in some cases to what is known as burnout.

1.4.7. Research

In the Cancer Strategy of the Spanish National Health System proposal of 2005, an analysis was made of the situation of cancer research within the national and international context and of the structure of the cancer research system in Spain, in which the following problems were identified:

a) Low level of funding
b) Researching of little “critical mass”
    a. Working groups highly dispersed
    b. Shortage of technical personnel
    c. No professional researching degree studies
    d. Shortcomings in technology transfer
c) Lacking connection among basic, clinical, epidemiological and translational cancer research
d) Science and society disconnected, society not seeing the need for research
e) Spain’s Health System organized around the Autonomous Community system

In view of the foregoing problems, there was a consensus regarding the solutions to implement, based on:

a) Significant, realistic economic funding in keeping with the objectives set.
b) Foster cooperative, multidisciplinary and multicenter research
c) Apply criteria of excellence in research in the evaluation of centers and groups
d) Maximum scientific productivity, measured by objective criteria.

e) Maximum competitiveness, under equal conditions, among researching groups.
f) Paired evaluation system determining whether or not the objectives are accomplished.
g) Work on models based on the public and private European Centers and the U. S. Cancer Centers Network (NCI: Comprehensive Cancer Center).

The implementation of the objectives and actions set out under the Strategy over recent years has led to the current situation, the main characteristics of which can be summarized into the following sections.

Cancer research funding

One of the main problems identified in the 2005 Strategy was the low level of funding allocated to cancer research.

According to the European Cancer Research Management Forum (ECRM), direct investment in cancer research in Spain in 2004 was 38 million euros, putting our country in ninth position regarding investment efforts and above the European average, which was 3.9 million euros, although as yet far from the most advanced countries in this field, such as the United Kingdom, Germany and France, who invested more than 100 million euros annually in cancer research.

In reference to the per capita cancer investment, Spain was relegated to fourteenth position, Spain's spending being less than one euro per citizen, three times less than the European average. The United Kingdom is ranked in first place, with 13.18 euros per capita. Outside of the EU, the Report reveals Canada as devoting 8.66 euros, Japan 7.86 euros and Austria 8.05 euros. The United States remains in the lead worldwide, with an expense of 17.61 euros per capita.

Lastly, if the investment is compared to the Gross National Product (GNP), our country was ranked nineteenth, below Slovakia and the Czech Republic. If Europe invests 0,017% of its GNP in the fight against cancer, Spain allocated scarcely 0.0048%.

This survey also set out some data which was cause for concern, given that whilst a trend which began in Europe eight years ago by way of which progressively more funds were being allocated to applied cancer research in prejudice of the more basic studies is confirmed, there are two exceptions to this current: Spain and Denmark, where there has been an increase in the basic science output over recent years. Our country going against the current would be explained by a "combination of strategy management and/or limited funds which favor the least expensive research with which the money invested is recouped more rapidly", they suggest in the conclusions to said Report.

As was included in the Cancer Strategy of the Spanish National Health System in 2005, the cancer research in our country has some major strong points, there being research centers which possess a scientific-technical level and human resources enabling them to be fully competitive at the international level in cancer research. Despite this, many centers have still not been able to manage to compete on equal terms with similar organizations from other countries due mainly to the long-standing endemic problem of lack of stable funding at the center level for both infrastructures and personnel.

However, some specific facts go to stand as proof of the change which is taking place and, to cite some very recent events, Spain will be taking part in three projects of international importance, such as: its participation in the International Regenerative Medicine Alliance (known as G4), with 30 million euros in funding; the Ultrasequencing Platform, with 15 million euros in funding and, lastly, the International Cancer Genome Consortium (ICGC or G8), funded with 10 million euros for the purpose of identifying the genetic alterations of the 50 most common types of cancer with five years' time. In this last case, this initiative has arisen directly out of the networking activity (Theme-Based Cooperative Cancer Research Network) promoted by the Cancer Strategy of the Spanish National Health System.

Research groups creation and consolidation

Similarly, a situation was brought to light which was characterized by:

a) the existence of few research groups of well-known international prestige and competence
b) an irregular distribution around the country with a high concentration in Madrid and Barcelona
c) a strong dispersing effect and scant effective functional interactions among them, especially in the hospital realm
d) the practically nil recognition of the clinical research in the hospital realm, as well as the total lack of specific spaces for carrying out research work
e) shortage of technical personnel with the proper training and, lastly,
f) there being no non-civil service professional researching degree program

The different Research & Development (R&D) programs which have been started up in Spain over the past few years, such as the "INGENIO 2010" initiative which includes the "CENIT", "CONSOLIDER" and "EUROINGENIO 2010" programs, have incorporated different initiatives and measures aimed at providing a solution to this situation by fostering the creation and consolidation of solid, stable research groups of a certain minimum size and which are not widely dispersed and by promoting specific spaces being assigned for carrying out the investigation work in hospitals.

Cooperative research

Some of the initiatives of capital importance within the different National R+D+i Plans have been those promoted by the Carlos III Health Institute over the past few years in regard to the development and enhancement of stable cooperative research structures, the Biomedical Network Research Centers (CIBER) and the Theme-Based Cooperative Health Research Networks (RETICs) devoted to promoting research of excellence in Biomedicine and Health Sciences which is conducted in the National Health System and in the National Science and Technology System. The Consortia supporting networked biomedical research (CAIBER) and the Health Research Institutes are more recent initiatives of the Carlos III Health Institute at the same address. All of the official initiatives promoted through the Ministry of Health and Social Policy have been rounded out quite adequately with private cooperative research initiatives such as the Cooperative Oncology Groups.

- *Biomedical Network Research Centers*

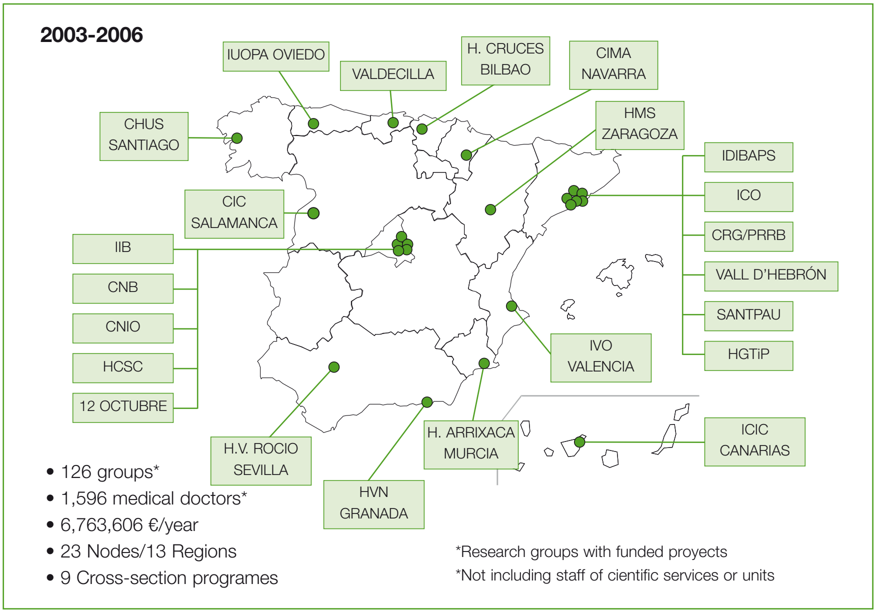
  The Networked Biomedical Research Centers, endowed with their own legal capacity and whose mission is - defined in broad terms- that of monographic research on a specific health problem or disorder.

  To date a total of 9 Networked Biomedical Research Centers have been set up, and although none of them is specifically focused on cancer research, there are research groups in many of them which have specific interests in cancer research:
  - Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN)
  - Epidemiology and Public Health(CIBERESP)
  - Physiopathology of Obesity and Nutrition (CIBERobn)
  - Respiratory Diseases (CIBERES)
  - Digestive and Liver Diseases (CIBERehd)
  - Neurodegenerative Diseases (CIBERNED)
  - Rare Diseases (CIBERER)
  - Mental Health (CIBERSAM)
  - Diabetes and Associated Metabolic Diseases (CIBERDEM)

- Theme-Based Cooperative Health Research Networks

  The Theme-Based Cooperative Health Research Networks were initially created as part of the National Scientific Research, Development and Technological Innovation Plan (2000-2003) as organizational structures formed by the association with the Carlos III Health Institute from a varied combination of biomedical research centers and groups which are of a multidisciplinary nature and operate under the different public administrations or under the private sector and pertaining to a minimum of four Autonomous Communities for the purpose of carrying out cooperative research projects in the general interest.

Initially, two types of networks, 13 networks of centers and 56 networks of groups, structured into 7 theme-based areas: Oncology, Neurology, Psychiatry and Aging, Infectious Diseases, Cardiovascular, Rare Diseases, Public Health and Health Services and Transplants were set up, with the participation of a total of 1,469 research groups and 10,119 researchers from 280 institutions.


2003-2006

- 126 groups*
- 1,596 medical doctors*
- 6,763,606 €/year
- 23 Nodes/13 Regions
- 9 Cross-section programes

*Research groups with funded proyects
*Not including staff of cientific services or units

In the field of Oncology, a Theme-Based Cooperative Research Network of Cancer Centers was formed and was comprised of 23 institutions grouping together 126 research groups and 1,596 researchers located throughout 13 Autonomous Communities. In addition to this network of centers, another 12 networks of groups with specific interests in conducting cancer research were also set up:

- RITSI. Molecular pathology of solid childhood tumors
- Multiply myeloma and other gammapathies
- Molecular study of pancreatic ductal carcinoma

- EPICUR_RED. Etiology, clinical aspects and molecular genetics of bladder cancer.
- Identification, analysis and validation of clinical, biological and molecular markers of importance in the improvement of the prognosis of brain tumors.
- RESITRA. Network for the study of infection in solid organ transplants and hematopoietic progenitors.
- New immunogenotype studies in the classification and treatment of acute myeloid leukemia (AML) and myelodysplastic syndrome (MDS).
- Applications of molecular and cellular biology to the diagnosis and treatment of patients with Fanconi anemia.
- REMA. Spanish Mastocitosis Network.
- Molecular classification of lymphoproliferative processes.
- IM3. Molecular medical image and multimodality.
- Cell therapy.

The Theme-Based Cooperative Research Networks implemented in 2003 were put on an international evaluation in 2006, the following having been assessed:

1. the scientific output of the network in the three years it had been operating.
2. the functioning of its networked organizational structure.
3. The actual interaction among centers and among groups of researchers comprising each one of the networks.
4. The training activities they have undertaken.
5. Any possible overlapping in objectives with other similar theme-based networks, a total of 79% of the networks having successfully passed the examination of the international evaluators, 19 of them having been scored as excellent, one of which was the Theme-Based Cooperative Cancer Research Network (RTICC).

There are currently 23 networks funded by the Carlos III Health Institute:

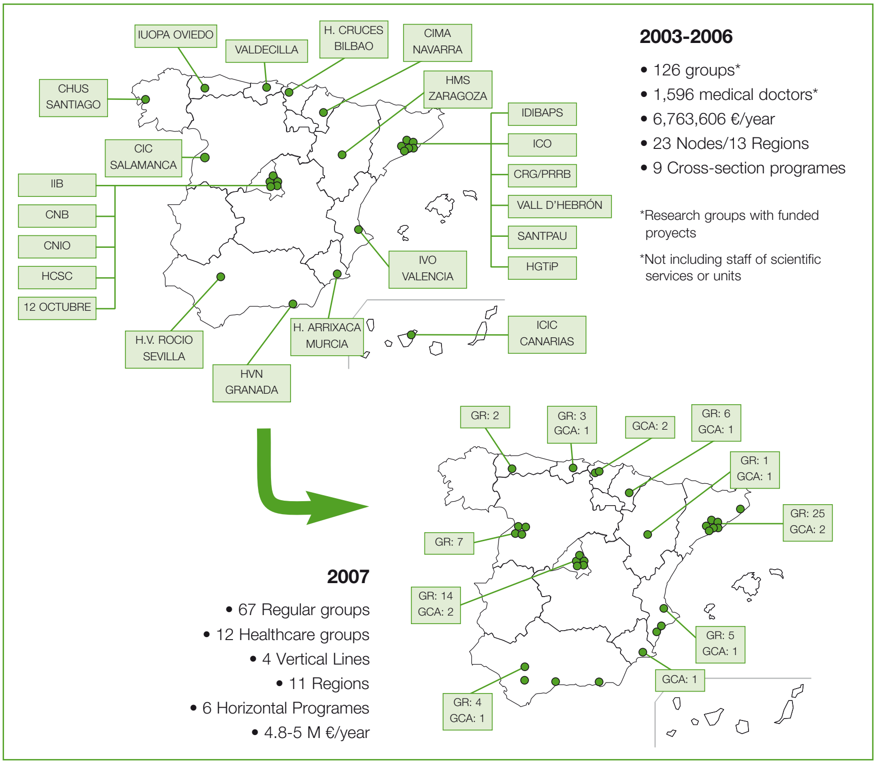
- Theme-Based Cooperative Cancer Research Network (RTICC).
- Addictive Disorders Network.
- Research Network on Cardiac Insufficiency in Spain (REDINSCOR)
- AIDS Network.
- Spanish Network for Infectious Disease Research (REIPI).
- Red HERACLES. Genetic and Environmental Determinants of Vascular Dysfunction.
- Cell Therapy Network.
- Mental Diseases and Mood and Psychotic Disorders Network.

- Theme-Based Cooperative Research on Aging and Frailty Network (RETICEF).
- Risk Factors, Evolution and Treatment of Cardiovascular Diseases (RECAVA).
- Diabetes and Associated Metabolic Diseases Network (REDIMET).
- Renal Disease Research Network (REDINREN).
- Research Network on Health Promotion and Prevention Activities in Primary Care(REDIAP).
- Tropical Diseases from Genomics to Control (RICET).
- Neurovascular Network (RENEVAS).
- Eating Healthy in Primary Prevention of Chronic Diseases (PREDIMED).
- Spanish Multiple Sclerosis Network (REEM).
- Eye Disorders of Aging, Visual Quality and Quality of Life.
- Network for Research of Adverse Reactions to Allergens and Drugs (RIRAAF).
- Theme-Based Cooperative Research Network in Computational Biomedicine (COMBIOMED).
- Biobanks Network.
- Network for Innovation in Medical and Healthcare Technologies.
- Theme-Based Cooperative Cancer Research Network (RTICC).

The current 2006-2010 Theme-Based Cooperative Cancer Research Network (RTICC) came into being out of the call for applications made by the Carlos III Health Institute in 2006 and is based on the unification of strategy and research plans from several of the cancer research networks which were scored as being excellent following the evaluation of their activity throughout the three years they had been operating (2003-2006). These networks included:

- The Theme-Based Cooperative Cancer Research Center Network (RTICCC: 23 centers, 126 groups and 1,596 researchers).
- the networks of groups known as “Molecular classification of lymphoproliferative processes”.
- “Multiple myeloma and other gammapathies”.
- “Molecular pathology of childhood tumors”.

A number of individual groups from other networks of groups from the field of cancer or which were previously not integrated into network setups were also incorporated.



2003-2006

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*Research groups with funded proyects

*Not including staff of scientific services or units

2007

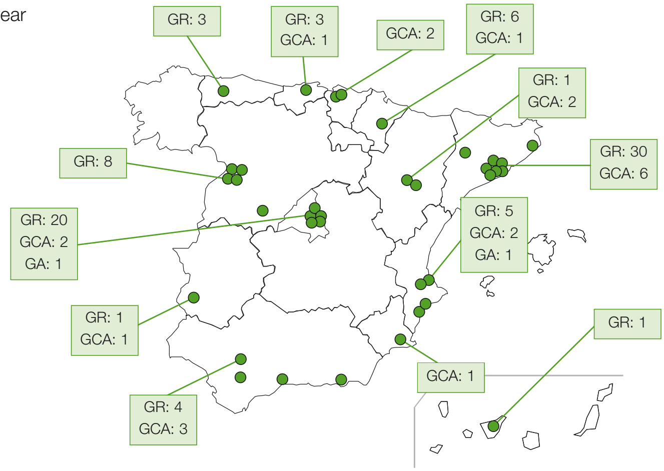
- 67 Regular groups
- 12 Healthcare groups
- 4 Vertical Lines
- 11 Regions
- 6 Horizontal Programes
- 4.8-5 M €/year

The setting up and funding of this network was supported on one hand by the recommendations of the international evaluators, who judged the activity of the aforementioned networks and who recommended continuing and stabilizing these networks based on the excellent results achieved and, on the other hand, out of the need for networked research in the current situation of research in the field of cancer in Spain and, lastly, as a result of how good the experience had been with the theme-based networks in the field and the advisability of continuing them in the future, in addition to their having been clearly argued in favor of in the previous Cancer Strategy of the Spanish National Health System document approved by the National Health System Interterritorial Council in its Research division

The Theme-Based Cooperative Cancer Research Network (RTIC) currently groups together 105 cancer research groups (82 regular groups, 21 care-providing clinical groups and 2 associated groups) with more than 1000 researchers working together in coordination with one another in 52 institutions (universities, Public Research Organizations and hospitals) located throughout 13 Autonomous Communities.

2008

- 82 Regular groups
- 21 Healthcare groups
- 52 Institutions
- 13 Regions
- ± 6 M €/year



www.rticcc.org

These research groups, coordinated through the Salamanca Cancer Research Center, work together, structured into 4 vertical lines of Research and into 6 transversal platforms serving the research groups of the network proper and numerous research groups outside of the Theme-Based Cooperative Cancer Research Network pertaining to hospitals, public and private research centers, universities and pharmaceutical companies, each one of which is coordinated by one or more researchers from the groups belonging to the Theme-Based Cooperative Cancer Research Network according to the actions set out in the previous Cancer Strategy of the Spanish National Health System document of 2005.

Vertical lines:

- Molecular mechanisms in the development and progression of cancer
- Molecular epidemiology and sporadic and familial cancer prevention
- Hematological tumors (Myeloma, myeloid neoplasias and lymphomas
- Solid tumors and pediatric tumors

Horizontal platforms

- Training and mobility

- Tumor banks
- Genomics, Proteomics and Bioinformatics
- Genetic molecular and imaging diagnosis
- Tumor Registry, epidemiological records, prevention and biostatistics
- Translational research

Regarding the success of this experience, worthy of special mention are findings through the collaboration of two or more groups of the Theme-Based Cooperative Cancer Research Network within the two years this Network has been in operation: 278 joint publications and over 1000 individual publications by each group, application filed for 9 patents, 232 joint research projects started, 312 clinical trials in collaboration with network groups and other national and international groups and 11 innovation activities. Similarly, numerous meetings have been held by the groups that are working jointly on the different lines and programs, new services catalogues and a training offer for the youngest researchers in the Theme-Based Cooperative Cancer Network, including travel expenses for attending courses and congresses, aid for the exchange of researchers among the different groups pertaining to the Theme-Based Cooperative Cancer Network, says at national and international centers of excellence and aid for the incorporation of new researchers.

- *Consortium for the support of networked biomedical research (CAIBER)*

This Consortium for the Support of Networked Biomedical Research (CAIBER) is a stable structure with its own legal capacity in form of a central clinical research and clinical trial unit comprised of units from the National Health System care centers, which provide common services and infrastructures for conducting randomized prospective intervention trials (including prevention, diagnosis, treatment and services).

The objective of this consortium is to enhance the clinical research units of the healthcare institutions, with a particular interest in starting up clinical research studies in the National Health System which are not of commercial interest and which, among other aspects, improve the information which the National Health System possesses regarding its preventive, diagnostic as well as treatment and care-related interventions.

The Consortium for the Support of Networked Biomedical Research (CAIBER) is currently comprised of 40 clinical research units located in Andalusia, Aragon, Asturias, Balearic Islands, Canary Islands, Cantabria, Catalonia, Castile-La Mancha, Castile and Leon, Community of Valencia, Extremadura, Galicia, Madrid, Murcia, Navarre and Basque Country, three of which are devoted exclusively to research in Primary Care.

On November 25, 2008, the forming of the aforesaid consortium was formalized by way of the signing of the founding bylaws and the agreement between the Carlos III Health Institute (ISCII) and the entities to which the 40 clinical research units of which it is comprised pertain.

CONSORTIUM FOR THE SUPPORT OF NETWORKED BIOMEDICAL RESEARCH (CAIBER): CLINICAL RESEARCH UNITS

- *Cooperative Groups*

The Cooperative Groups are legal non-profit entities comprised of oncologists or other cancer specialists who band together for the purpose of promoting cancer research in the different specialties thereof (lung, breast, colon, etc.)

The main role of these cooperative cancer research groups is to evaluate the efficacy of new treatments by means of large-scale randomized trials. Hence, studies are conducted and coordinated in collaboration with different centers and specialists, which sometimes entails the tune-up of genetic and molecular research techniques, as well as the development of new drugs.

Over the past few years, these cooperative groups have increased their role in cancer prevention by means of randomized trials researching drugs possibly able to reduce the cancer incidence rate in patients at a greater risk of having this disease.

The work of the cooperative groups usually starts through a multicenter network of researchers who have applied to take part and are qualified to do so. The participating centers directly supervise the inclusion of the participants in the clinical trials, the course of their treatments and the supplementary care provided, as well as the long-term results and notify the data to a center coordinating the trial.

Clinical trials being conducted on the part of cooperative groups involves an integrated effort by various parties, including the principal investigators, the investigators from the pharmaceutical industry and the legally-competent organizations.

The following is the list of cooperative groups currently operating in Spain:

- Spanish Group for Digestive Tumor Treatment (TTD)
- Cooperative Oncological Research Group (ONCOPAZ)
- Spanish Lung Cancer Group (GECP)
- Spanish Solid Tumor Intensification and Associated Strategies Group (SOLTI)
- Spanish Sarcoma Research Group (GEIS)
- Spanish Germ Cell Tumor Group (GG)
- Spanish Breast Cancer Research Group (GEICAM)
- Spanish Urological Cancer Group (SOGUG)
- Spanish Ovarian Cancer Group (GEICO)
- Spanish Breast and Ovarian Cancer Research Group (PSAMOMA)
- Spanish Medical Neuro-oncology Group (GENOM)
- Spanish Head and Neck Tumor Treatment Group (TTCC)
- Oncological Group for the Lymphoma Treatment and Study (GOTEL)
- Asthenia Study Group (ASTHENOS)
- Spanish Neuroendocrine Tumor Group (GETNE)
- Cooperative Group (ONCOSUR)
- Spanish Multidisciplinary Digestive Cancer Group (GEMCAD)
- ACROSS
- Radiation Therapy Oncology Research Group (GIOR)
- Spanish Neuro-Oncology Group (GENO)

Despite all these initiatives, it is necessary to continue making further headway in aforementioned fields of crucial interest for oncology, such as setting up a stable platform for making it possible for a good national system to exist for storing, cataloging and supplying tumor samples, the optimum development of a population-based tumor registry and promoting the clinical and translational initiatives for the development of new treatment routes, diagnostic methods and technologies which will aid in diagnosing and treating cancer patients.

Apart from the above, the Theme-Based Cooperative Cancer Research Network will provide the appropriate basis for the participation of

Spanish groups in functionally similar cooperative networks comprising part of the European Framework Programs.

In short, the National Health System's National Cancer Strategy must be based on and make use of all the work and the infrastructure generated and achieved through the Theme-Based Cooperative Cancer Research Network (RTICC) and all of the other cooperative structures which are working in cancer research and also make best use of all the existing resources not integrated into the network, for clinical, basic and epidemiological research of recognized standing and proven scientific quality.

Scientific and Technological Results

One of the objectives set in 2005 in the Cancer Strategy of the Spanish National Health System was the need of increasing the scientific output of our research centers and groups as an indicator of the quality and excellence of our research system and of our researching efficiency, promoting a common, objective evaluating system in general and a cancer evaluating system in particular at the nationwide level with regular reviews of the researching centers and the groups comprising the same which would serve to measure, on equal terms, the productivity and competitiveness of any cancer research group anywhere nationwide and thus make it possible and assure that the finest science is that which is funded.

Spain is in good condition regarding its medical output, being ranked tenth worldwide and seventh within the European context, where it would then be the fourth strongest if the publications form the biotechnology field are taken into account.

The strong growth of Spain's scientific output has meant Spain's contribution having grown from its 2.1% of the worldwide total for 1995 to its 3.1% in 2006.

The contribution of biomedical research to the worldwide output of knowledge is 2.4%, doubling its relative importance of 15 years ago and totaling now practically 50% of Spain's science. By fields, the international publications and journals focus on the realm of clinical medicine, totaling 28.9%, followed by basic biomedical research, totaling 23.7%. Additionally, the scientific documents related to biomedicine are those cited to the greatest extent. The Autonomous Communities in which more citations are originated are, in this order and for the last thirty years: Autonomous Communities of Madrid, Catalonia, Andalusia and Valencia.

When an analysis is made of the spread among the different specialties according to Spain's Biomedicine and Health Sciences bibliometric map (1996-2004), Oncology is found to be ranked fourth in the number of documents produced within the aforesaid period and ranked first in the number of citations. Oncology is also the third-ranked discipline with the greatest number of citations per document, with 13.75 citations per document, and the fourth-ranked regarding international collaboration.

The number of documents generated in the field of oncology has also practically doubled within the 1996-2004 period (meaning an 184% increase), above the average for all of the other disciplines, giving an idea of the efforts made in this regard by the research centers and research groups working in this field.

Research staff and research specialists

According to the Spanish National Institute of Statistics (INE) data in 2006, Spain's R+D activity was employing 188,978 people (Full Employment Equivalence), a total of 115,798 of whom were researchers, in other words, 61% of the total. In 2006, employed in R&D in Spain was 136% higher than in 1995, showing a growing trend in all of the sectors in operation.

The human assets in R&D totaled 9.6 per thousand of the working-age population in Spain, with a total 145.8% cumulative growth rate as far as solely researchers are concerned for the 1990-2006 period. Despite this growth rate, there is still a considerable gap with the Northern European economics, such as is the case of Finland, with 22 out of every 1,000 working-age citizens working in R&D, or Sweden 17/ 1,000 and Denmark 16/1,000 working-age citizens.

When one takes a look at the human resources working in biomedical research, one comes to the conclusion that there are still a smaller number of researchers working in this sector in Spain than in other countries in our surrounding environment. Besides, in the National health System, specifically in the hospital realm, basic research is scant, there being no connection among translational, clinical and epidemiological research. This deficit must be covered with the incorporation of quality basic, clinical and epidemiological researching staff at the hospitals and through the promotion of collaboration among groups of disciplines and different fields of knowledge from universities, public research agencies and health centers, as well as facilitating access to and use of technologically complex resources.

No connection among basic, clinical and epidemiological research

For quality clinical research, it is necessary to also have quality health care, as clinical research improves the quality of the care provided and must be fostered as an activity essential to modern primary and specialized medical practice in its different aspects. Therefore, the hospitals must carry out specific clinical research projects in the three aspects thereof: basic, clinical and especially the transnational aspect.

In the case of cancer research, a marked division and a lack of connection is found to exist among basic, clinical and epidemiological research in our country. Hence, the individuals cases of good basic and/or clinical research on cancer conducted by clinical researchers at university schools or health centers in Spain have seldom established an interrelationship, thus losing out on some major chances for mutual enrichment.

For example, there is still as yet no professionalized platform with stable funding in Spain affording the possibility of there being a national tumor simple storage, cataloging and supply system (tumor Banks) or we are still lacking an optimum development of a population-based tumor registry, and we are lagging far behind other countries in clinical and translational initiatives, such as the development of new treatment routes, diagnostic methods and technologies aiding in diagnosing and treating cancer patients.

To date, these shortcomings are being covered by individual initiatives out of the individual willingness of researchers, researching groups and/or centers. However, given the impact on the population which cancer, other prevalent disorders and rare diseases have on the population, the success of these research efforts can only be achieved through cooperative, multicenter initiatives.

Given that the preferred realm in which translational cancer research is conducted is that of university hospitals or research centers directly connected to a university, combined clinical/translational research units must be created in hospitals so that the physicians proper can devote time to research.

The Health Research Institute Accreditation Program set forth under Law 16/2003 of May 28, 2003 and regulated under Royal Decree 339/2004 of February 27, 2004 and Ministerial Order SCO/1245/2006 of April 18, 2006, the objective of which is to promote and foster the relationship between the university hospitals and the large research centers and to bring basic and clinical research closer together, enhancing the concept of the Hospital as a Research Center, may be a good model for developing a transnational research which will group together basic, clinical, epidemiological and translational cancer research.

To date, the following have been accredited as Health Research Institutes: The "Augusto Pi i Sunyer" Biomedical Research Institute in Barcelona (IDIBAPS), the Biomedical Institute of Seville (IBIS), the Valld'Hebron University Hospital Research Institute (IR-HUVH) in Barcelona, the "Germans Trias i Pujol", Health Science Research Institute Foundation in Badalona and the Bellvitge Bioimedical Research Institute (IDIBELL) in Barcelona.

Relationship between the researching field and other realms of the Cancer Strategy

Due to its horizontal nature, the researching realm must interact directly with each and every one of the Cancer Strategy areas of intervention. Specifically:

- he joint consideration and coordination of the different lines of cancer research (basic, clinical, epidemiological, translational or applied) must take the form of starting up the research units integrated into the hospitals which will make effective, functional interaction possible among the researchers and researching work done at the clinical, basic or care-providing level. The implementation of a professional researching degree program in the National Health System would be of major help in this regard.

- Enhancing cooperative networked research must mean stable support on the administrative and economic plane both of the Theme-Based Cooperative Cancer Research Network (RTICC) as well as the frameworking necessary to provide the basis for starting the provide solutions to the structural problems of cancer research in our country. Hence, the horizontal programs of said them-based network which are focused on training and the exchanging of research or the development of tissue banks and tumor data and registry have a direct impact on these needs of the Cancer Strategy.
- The primary prevention area would benefit directly from the findings of the horizontal programs of the Theme-Based Cooperative Cancer Research Network focusing on genomics and proteomics, bioinformatics analysis, biostatistics and epidemiology of cancer.

The early detection area benefits directly from research programs on molecular and cellular technology in cancer diagnosis and research.

- – The areas providing the care for adult and child cancer patients can benefit directly from the programs of registries, non-invasive methods, animal models and treatment strategies. Develop a specific research program aimed at supporting the palliative care area, an aspect currently developed to only a minor degree.

2. Strategy Execution

2.1. Health promotion and protection

Objectives

Objective 1: The prevalence of ex-smokers in Spain (or in any Autonomous Community) must be higher than 23%, and an analysis made as to whether any difference exists by gender.

Objective 2: The prevalence of daily smoking in the adult population (age 16 or above) in Spain (or any Autonomous Community) shall have been lowered to 24% (males 28%, females 20%).

Objective 3: The prevalence of smoking in young people (16-24 age range) in Spain (or in any Autonomous Community) must be lower than 23% and an analysis made as to whether any difference exists by gender.

Objective 4: Delay the start of the smoking habit by half a year in the age 14-18 population.

Objective 5: In the Autonomous Communities, interventions of a population-based nature or in risk groups conducive to improving the lifestyles, eating habits and physical activity related to cancer are to be started. One priority will be to reverse the trend of childhood and adult obesity.

Objective 6: Reduce at risk drinking taking into account the difference between genders.

Recommendations

- That schools implement specific programs fostering the preventive measures which avoid starting tobacco smoking and encouraging health living habits.
- That smokers have access to measures to help them quit smoking by means of the appropriate interventions depending on the stage of change (stage of change model): minimal counseling, personalized and specialized care.
- That special consideration be given to the groups of healthcare professionals and educators in the design of preventive and care-providing strategies by way of specific programs which include treatment for quitting smoking and the measures at the workplace which make them feasible.
- That the public and private workplaces (health care centers, schools, government centers and company workplaces) be incorporated into the network of smoke-free spaces on an integral basis. In the case of

the public centers, that these criteria be included in their contracts, programs and union agreements.

- That the different Autonomous Communities be encouraged to prepare integral smoking habit plans which will take in the legislative, promotion and care-providing measures which have currently shown themselves to be most effective, in coherence with the National Tobacco Smoking Prevention Strategy.
- That measures be carried out on the subject of education, raising awareness and promoting healthy lifestyles and habits targeting professionals and the general population.
- That the amendment of the legislation in effect at both the Central Government and Autonomous Community levels aimed at protecting the health of individuals exposed to tobacco smoke be promoted. Specifically, that the prohibition of smoking tobacco in public areas be promoted.
- In the Autonomous Communities, that the interventions be started up for reducing exposure to second-hand smoke, mainly in more vulnerable groups such as the childhood population and pregnant women.
- That programs be offered for quitting smoking for the entire population, emphasizing the following categories: exemplary groups (fields of education and health care) and special risk groups (pregnant women, smoking population who have a disorder caused or worsened by smoking tobacco…).

2.2. Early detection

2.2.1. Breast cancer

Objectives

Objective 7: Early breast cancer detection

a) Continue carrying out population screening programs for breast cancer already under way, based on the following:
  - Target population: Age 50-69 age range
  - Screening test: Mammogram
  - Time interval between examinations: 2 years

b) Promote and consolidate quality surveillance and evaluation systems for these programs, enhancing the development of information systems making an overall combined evaluation and an evaluation by Autonomous Communities possible of both the process per se as well and the impact thereof, according to the standards set out in the European quality control guides. This evaluation is to be made through Spain's Cancer Screening Program Network.

Objective 8: Promote the evaluation of the familial risk of cancer, including the indication of conducting a study and genetic counseling of those individuals who meet the criteria for a hereditary risk of cancer.

Recommendations

- That the Autonomous Communities carry out population screening programs following the recommendations of the European Mammogram Quality Control Guides.
- That systems for attracting new participants be enhanced and promoted making it possible to achieve at least a 70% participation. The females will be provided with sufficient information on the characteristics of the programs and on the validity and risks and benefits involved in the process so as to be able to make an informed decision as to their participation in the program.
- That total quality guarantee programs be carried out dealing with all the stages of the program, placing special emphasis on the development of an image quality control.
- That a complete follow-up of the cases detected be assured. The circuits for referring and studying the cases which have screened positive are to be clearly defined so as to guarantee the process of confirming the diagnosis and the treatment with the shortest length of time possible. For this purpose, the reference centers for diagnosis and treatment will have sufficient resources to guarantee the confirmation of diagnosis and integral treatment of the patient with a maximum guarantee of quality.
- That the programs avail of an information system which will afford the possibility of daily management, quality control and regular evaluation.
- That specific monitoring programs be organized for females who have personal past histories of lobular carcinoma in situ or atypical epithelial hyperplasia.
- That the setting up of multidisciplinary units specialized in genetic counseling in cancer be promoted for evaluating the familial risk of females subject to experiencing a hereditary cancer syndrome. For this purpose that the following be taken into account:
- Families with three of more direct family members (at least one first-degree relative of the other two) affected by breast and/or ovarian cancer.

- Families with less than three family members affected by breast and/or ovarian cancer who also meet the criteria of any of the following high-risk factors:
  - Breast cancer diagnosed when younger than 30 years of age.
  - Bilateral breast cancer diagnosed when younger than 40 years of age.
  - Breast and ovarian cancer in one same patient (synchronous or metachronic).
  - Male breast cancer.
  - Two cases of breast cancer, first-degree relatives, diagnosed when younger than 50 years of age.
  - Two or more first-degree relatives affected by ovarian cancer, regardless of at what age.
  - A breast cancer and an ovarian cancer in the first-degree relatives.
  - A family member has a genetic mutation (BRCA1, BRCA 2).
- The National Health Survey will include information in regard to mammograms being taken so as to be able to evaluate screening mammograms being taken outside of the organized programs.

2.2.2. Cervical cancer

Objectives

Objective 9: Early detection of cervical cancer

a) Optimize the performing of cytologies in moderate /low-risk females so that they will be performed meeting the following requirements:
   - Target population: Asymptomatic females who are or have been sexually active, of ages within the 25-65 age range.
   - Screening test: cervical cytology
   - Time interval between examinations: When coming in for the first time, two cytologies spaced one year apart will be performed. In the case they test negative, the recommended interval will be 3-5 years following two normal cytologies.

The objective is set of 70% of the females within the 30-60 age range having had a screening cytology performed within the last five years.

b) Guarantee a specific monitoring being conducted in programs organized for females at high risk.

Recommendations

- That specific monitoring programs be organized for females at high risk of having cervical cancer, defined as females from countries with a high incidence rate of cervical cancer and/or subject to an associated disorder (HIV or other sexually-transmitted diseases).

- Although the cytologies not be performed within the framework of an organized population-based program, they will be subject to the recommendations of quality controls which are required of a population-based program. That the entire activity will be organized following the recommendations of the European Quality Control Guides and that of the scientific societies involved.
- That the National Health Survey collect information in relation to these tests being conducted so as to be able to assess whether the screening cytologies are meeting the stipulated requirements.

2.2.3. Colorectal cancer

Objectives

Objective 10: Early detection of colon and rectal cancer.

a) Implementing colon and rectal cancer screening programs for moderate /low risk population organized on a population basis, the bases of which are stipulated as follows:
   - Target population: 50-69 age range, in an initial stage.
   - Screening test:fecal occult blood test
   - Time interval between examinations: 2 years

By 2015, that a 50% nationwide coverage for this age group have been achieved.

b) Set up quality surveillance and evaluation systems for these programs, promoting the developing and starting up of information systems making the overall evaluation and an evaluation by individual Autonomous Communities possible for both the process per se as well as the impact thereof in accordance with the standards set out in the European quality control guides. This evaluation would be conducted by way of the Spanish Cancer Screening Programs Network.

Specific monitoring programs be organized for high-risk individuals (adenomatous polyps considered high risk or inflammatory bowel disease).

Objective 11: Promote the evaluation of familial risk of cancer, including the indication of conducting study and genetic counseling of those individuals who fulfill the criteria of hereditary risk of cancer for those syndromes for which diagnostic tests are available and which are clinically applicable (non-polyposic colon syndrome and familial adenomatous polyposis).

Recommendations

- That the integration of the screening programs which are progressively started up in the Spanish Cancer Screening Program Network be fostered and promoted for the purpose of homogenizing and protocolizing all of the activity of these programs.
- That a thorough evaluation be made of the different pilot projects and programs currently in existence for the purpose of determining aspects including:
  - Method for attracting participants which will make it possible to achieve the utmost degree of participation and adherence.
  - Type of screening test and how performed so as to give rise to the minimum number of false positives possible.
- That an evaluation be made of the material and personnel resources which will be need for confirming the diagnosis and treatment of anomalies detected for the purpose of determining the length of time within which it will be feasible to fully implement these programs.
- The general awareness-raising actions be carried out targeting both healthcare professionals as well as the general population regarding the advantages, benefits, risks and limitation of early colorectal cancer detection.
- That the evaluation agencies regularly review the new evidence regarding the effectiveness of colorectal cancer screening by way of new methods, specifically the role of sigmoidoscopy, colonoscopy and strategies using combined methods.
- The National Health Survey will include information in relation to the fecal occult blood test being used so as to be able to evaluate this test being conducted outside of organized programs.
- That specific protocols be developed for monitoring the entire population at risk of colorectal cancer in terms of the different determinants of said risk so as to be able to establish the screening guideline indicated in each case. That these programs will be organized and subject to the same standards of quality which are required of any screening program.
- That the different care-providing levels actively attract the individuals who are at high risk by means of setting out specific protocols so as to determine the specific screening guideline in terms of their risk.
- That the setting up of units specialized in genetic cancer counseling which can provide individuals at a hereditary risk of having this tumor with some answers be enhanced.

2.3. Adults care

Objectives

Objective 12: In those patients suspected of having breast or colorectal cancer on the basis of a well-founded clinical opinion, the process of confirming diagnosis will be set into motion within the two-week period immediately subsequent to the cancer being suspected. The suspicion will be measured upon receipt of the request by the healthcare center, by distinguishing between those cases coming from organized screening programs from all other cases.

This indicator shall be defined in keeping with the definition set out in the report: Saura et al. Development of process indicators and results and evaluation of the cancer care-providing process. Healthcare technologies evaluation report (AATRM 2006/02). Madrid: Ministry of Health and Consumer Affairs, 2007.

Objective 13: The treatment-related decision must be based on the clinical practice guides and protocols of each hospital for each type of tumor. The patients diagnosed with cancer shall be treated within the framework of an integrated, multidisciplinary team, preferably in a tumor committee and with one professional serving as a reference point for the patient. This reference point may vary over the course of the hospital treatment process, although the patient must be informed of each change.

The roles of each professional must be defined, especially that of the tumor committee coordinator, that of the reference point for the patient and that of the male nurse managing care-providing processes were the case to be. The treatment process must end with an overall report which is to be given to the patient.

These indicators are to be identified in keeping with the definition in the Report:

Saura et al. Development of process indicators and results and evaluation of the cancer care-providing process. Healthcare technologies evaluation report (AATRM 2006/02). Madrid: Ministry of Health and Consumer Affairs, 2007.

Objective 14: The time lapse from the treatment-related decision being made up to the treatment actually being started is to progressively adapt to the following recommendations:

- Surgical treatment : 2 weeks recommendable
- Chemotherapy: 1 week recommendable
- Radiation therapy: 4 weeks recommendable (including the planning process).

The definition of these indicators is to be set out in keeping with the definition of the report: Saura et al. Development of process indicators and results and evaluation of the cancer care-providing process. Healthcare technologies evaluation report (AATRM 2006/02). Madrid: Ministry of Health and Consumer Affairs, 2007.

Objective 15: The follow-up, after having fully completed the multidisciplinary treatment, must be carried out preferably by one single professional to be determined by the specialists involved within the framework of the tumor committee or the functional unit.

The definition of these indicators is to be set out in keeping with the definition of the report: Saura et al. Development of process indicators and results and evaluation of the cancer care-providing process. Healthcare technologies evaluation report (AATRM 2006/02). Madrid: Ministry of Health and Consumer Affairs, 2007

Objective 16: The National Health System will make clinical practice guides available for the main tumor sites which will guarantee the minimal criteria based on the best scientific evidence which a cancer patient must be dispensed in the diagnosis and treatment process. The clinical guides must be updated every two years and must be based on those approved by the Health Guide project and have the collaboration of the scientific societies.

Objective 17: Evaluation of the care-providing practice. In order to evaluated the aforementioned objectives in a methodologically reliable manner equitable for all of the different Autonomous Communities, a review is to be made of the common and transversal clinical information for all of the Autonomous Communities as far as breast, colorectal and lung cancer are concerned, based on the indicators agreed upon with the scientific societies for evaluating the established objectives.

The definition of these indicators is to be set out in keeping with the definition of the report: Saura et al. Development of process indicators and results and evaluation of the cancer care-providing process. Healthcare technologies evaluation report (AATRM 2006/02). Madrid: Ministry of Health and Consumer Affairs, 2007

Objective 18: Care-providing process evaluation. To evaluate the mortality rate of the complex surgical procedures performed for curative purposes in esophageal, stomach, pancreatic, rectal, lung cancers, neuro-oncology and liver metastasis. Similarly, an evaluation is to be made of the percentages of breast cancer treatments performed with conservative surgery.

Recommendations

- Promote within the tumor committee context the incorporation of the male case management nurse for the purpose of taking responsibility for the coordination of the treatment plan and of providing care for the patients' needs in the different stages thereof by managing the relationship with the patient and furnishing the patient with the necessary information for the care-providing process to function well.

- Set out well-founded criteria for clinical suspicion of cancer for the main tumors, in conjunction with the reference diagnostic test and the priority circuit for conducted the diagnostic test in question. The defined time intervals must be adapted to the clinical situation of each patient and to the type of tumor, given that they have a bearing on the complexity of the diagnosing and treatment process.
- Make clinical practice guides available to the National Health System professionals which include the diagnostic and treatment process by means of consensus with the professionals and the scientific societies based on the best available evidence. The process must have the support of the medical technology evaluationagencies and must take into account the prior experiences carried out within this realm.
- Set up tumor committees at each center, were none to exist, to evaluate all of the cases diagnosed and/or treated at the center with the participation of all the specialists involved in the respective cancer treatment process. The time intervals between treatments must be evaluated annually by the committee.
- Establish the mechanisms for collecting data and the methodology for evaluating the clinical results for the indicators selected. At the end of the period throughout which this plan remains in effect, an audit of clinical records is to be set out for evaluating delays in treatment and other results linked to the care-providing process.
- In all females in which cancer is highly suspected in the diagnosis according to the mammogram results (BIRADS IV and V), the diagnostic confirmation is to be made within the two-week period immediately subsequent to the date on which the suspicion arises. When the suspicion is clinical, this time period is to be measured as of receipt of the request by the diagnostic center.
- The treatment-related decision must be based on the clinical practice guides and protocols for each hospital for each type of tumor.

The follow-up subsequent to the therapy must preferably be carried out by a professional to be determined by the specialists involved within the framework of the tumor committee of the functional unit. The treatment process must end with an overall report which is to be given to the person having undergone the treatment.

- The hospitals which treat patients with cancer are to set out a methodology for evaluating the clinical results of the patients treated fully or in part at the hospital in question which will afford the possibility of at least evaluated the survival rates according to the stage in the diagnosis, the percentage of relapses and the surgical mortality rate at 30 days or within the same hospital admission. For

this purpose, it is recommended that the interdisciplinary care-providing process be equipped with a computerized medical record and a hospital record for at least the most frequent pathologies.
- The medical ethics-related recommendations set forth under the legislation make it mandatory to avail of the informed consent form from the patient in certain diagnostic and treatment-related interventions in oncology. Special emphasize must be placed on the full understanding on the part of the patients of the information furnished by the physician.

2.4. Child and adolescent care

Objectives

Objective 19. The care for children and adolescents diagnosed with cancer is to be provided in multidisciplinary oncology units which will favor psychosocial and educational care as of the point in time of the diagnosis and which will allow them to continue their maturing development and their education.

Recommendations

The objective of pediatric oncology in Spain must be not only to cure the child's or adolescent's cancer but rather to achieve their being a healthy adult from the physical, psychological, social and spiritual standpoint. It is therefore recommended:

- That the children and adolescents diagnosed with cancer must be treated in Pediatric Oncology Units of a multidisciplinary nature and designed by the Autonomous Communities in order for them to be provided with the finest treatment based on scientific evidence according to the protocols currently in effect which have been agreed upon by the national and international scientific societies.
- Set out criteria and protocols for referrals to the hematology and/or pediatric oncology unit.
- The children and adolescents diagnosed with cancer in Spain must be registered in the National Childhood Tumor Registry (RNTI-SEHOP).
- The children and adolescents diagnosed with cancer should be provided with psychological and educational care as of the point in time of the diagnosis and up to their being cured, including their rehabilitation, if any.
- The families of the children who die due to a childhood cancer must be provided with care and psychosocial follow-up.

- The diagnosis and treatment protocols must fully comply with bioethics criteria and must abide by the juvenile protection and children's rights law in force in Spain.

2.5. Palliative care

Objectives

On March 14, 2007, the National Health System Interterritorial Council approved the National Health System's National Palliative Care Strategy, the mission of which is that of improving the quality of the care provided to the patients in an advanced/terminal situation and their family members by promoting the integral, coordinated response on the part of the health system to their needs and respecting their self-sufficiency and values. The Strategy is for patients with cancer and evolving chronic illnesses of any age who are in an advanced and/or terminal situation.

The objectives, indicators and recommendations of this line of strategy are included in the Palliative Care Strategy of the Spanish National Health System. The text thereof is available on the Ministry of Health and Social Policy website: Ministerio de Sanidad y Política Social. (http://www.msps.es/organizacion/sns/planCalidadSNS/pdf/excelencia/cuidadospaliativos-diabetes/CUIDADOS_PALIATIVOS/estrategiaCuidadosPaliativos.pdf)

The general objectives of the Palliative Care Strategy are listed in following:

Objective 20. To provide the patients who are in an advanced terminal stage and their family members with an evaluation and integral care adapted at all times to their situation at any level of care and throughout the full length of the process of their evolution.

Objective 21. To provide the patients who have an illness in advanced/terminal stage with care based on the best practices and scientific evidence available.

Objective 22. To avail of an explicit organization model so that the patients will be provided with palliative care according to their needs and at the appropriate point in time, adapted to the different situations and territorial boundaries.

Objective 23. To set up an organizational system which will guarantee the coordination among the different health care and social resources and will promote integrated actions.

Objective 24. To foster the application of bioethics principles and the participation of the patients in their process in accordance with the principles, values and contents of the Law of Patient Autonomy and the legislation in force in the different Autonomous Communities.

Objective 25. To establish continuing training programs which are specifically for the health system professionals to enable them to adequately meet the needs of the patients with an illness in the advanced/terminal stage and their families.

Objective 26. To step up research in palliative care.

2.6. Quality of life

Objectives

All of the patients diagnosed with cancer as well as their family members and the healthcare personnel providing their care are to be provided with the integral care necessary to guarantee the adequate treatment of the disease and of the physical, psychological and social sequelae the illness in question entails, from the point in time of the diagnosis up to their recovery or death.

Objective 27: To provide psychological and social care for cancer patients and their families, according to their needs, based on the scientific evidence available concerning the effectiveness of the interventions.

These indicators are to be defined in keeping with the definition in the Report:

Saura et al. Development of process indicators and results and evaluation of the cancer care-providing process. Healthcare technologies evaluation report (AATRM 2006/02). Madrid: Ministry of Health and Consumer Affairs, 2007

Objective 28: To promote the rehabilitation for the physical and functional sequelae of the illness and its treatments. Special interest must be focused on the rehabilitation of lymphedema and the care of ostomies.

The definition of these indicators is to be set out in keeping with the definition of the report:

Saura et al. Development of process indicators and results and evaluation of the cancer care-providing process. Healthcare technologies evaluation report (AATRM 2006/02). Madrid: Ministry of Health and Consumer Affairs, 2007.

Recommendations

- Conduct a study of the employment-related, psychological and social needs, including the gender perspective, of the cancer patients and their family members within the framework of the National Health System
- Review the scientific evidence on the health intervention strategies and screening tools for identifying patients who are in need of specialized psychological care.

- Conduct a study on the characteristics of the psychological care which is provided within the National Health System for individuals diagnosed with cancer and their families.
- Promote a study on the long-term adverse effects of the treatments.
- Promote the emotional support of all of the professionals who are providing care for the patient by enhancing communicating skills.
- Provide psychological care for the patients and family members who so require, for the purpose of:
  - Reinforcing the information regarding the disease, its evolution and its treatment.
  - Enhancing the appropriate, healthy strategies for coping with the illness and the treatments of the patients and family members.
  - Detecting, evaluating and, if applicable, dealing with any responses potentially psychopathological at present or in the future.
- Provide social assistance for those patients and family members who so require, for the purpose of:
  - Counseling regarding patterns of organization and functioning in the patient's surrounding environment, sharing burdens, preventing co-dependence, etc.
  - Informing patients and family members as to their rights and obligations, as well as counseling them concerning resources and different types of aid affording the possibility of covering the care which the patient requires.
  - Promoting volunteering to facilitate accompanying the patients during their stay in the hospital and at home.
  - Promoting the organization of social support networks for patients and family members.
  - Facilitating counseling concerning reinsertion into the work force once a safeguard period in the evolution of the cancer has elapsed.
- Increase the resources available for the rehabilitation of cancer patients especially given their number and treatment-related potential in the prevention and treatment of lymphedema in breast cancer and the care of ostomies in colorectal cancer.
- Promote the ability of the professionals to identify and treat the nutritional problems which may go along with the illness of cancer.

2.7. Research

Objectives

Objective 29. Enhance networking of centers and/or groups of excellence in cancer research who are interconnected in a coordinated, cooperative manner. Additionally foster the creation and consolidation of stable, solid research groups integrated into accredited networks, enhancing the assigning of specific spaces and resources for carrying out their work within the framework of the health research institutes accredited by the Carlos III Health Institute (ISCIII).

Recommendations

- Set up a stable networked research structure on cancer in Spain (inter-Autonomous Community level) with funding mechanisms, regular evaluation and set rules for operating and exchanging resources, infrastructures and personnel. This structure must make use of the experience of the theme-based cooperative research centers (RTICCC) and of cancer groups promoted by the Carlos III Health Institute (ISCIII) with positive results over the last three years, as well as valid models from other countries, such as the National Cancer Institute (NCI) Intramural and Extramural Programs and its network of cancers centers located throughout different states in the United States.
- It is particularly important in this regard for the vertical lines and horizontal research programs of the theme-based cooperative cancer research networks to be maintained (training, tumor banks, tumor registries, biostatistics and epidemiology, genomics and proteomics, molecular diagnosis, non-invasive methods, animal models and new therapies), as well as the cancer research of the groups pertaining to other research networks Clinical Research Networks (CIBER).
- Set up integrated cancer research units/groups at least at all of the hospitals in the different Autonomous Communities which provided complete, integral cancer care, which will make actual functional interactions possible among the researches and the researching work at the clinical, basic, public health or care-providing level (surgery, radiation therapy oncology, medical oncology and the realms related to the diagnosis of cancer).
- This setting up process must necessarily go along with establishing and implementing a professional researching degree in the Health System in accordance with the proposals drafted by the Carlos III Health Institute which will allow and justify the work in these in-hospital research units.
- Boost and provide incentives for research work taking into account the gender perspective and the inequalities, as well as childhood clinical research on tumors which have a low incidence rate.

3. Evaluation and the Strategy Information Systems

3.1. Introduction

The evaluation, understood as a systematic, ongoing process which designs, obtains and provides scientifically valid, reliable and useful information for decision-making purposes, is an absolutely indispensable aspect of the Cancer Strategy of the Spanish National Health System and is understood as being an integral part thereof so as to be able to carry out continuing improvement in the approach for dealing with this illness.

The patients are the ones who clearly benefit from the evaluation, given that it contributes toward fostering, providing incentives for and improving integral cancer care by means of the control and optimization of the objectives put forth in the Strategy.

But the integral cancer care set out in the strategy, with the objectives which are taken into account ranging from health promotion to the quality of life of cancer patients, undoubtedly poses a challenge for the health system from the standpoint of its evaluation.

Conventionally, the existing information registries and sources are focused first and foremost on the care provided once the illness or the disease-causing event has occurred. More specifically, the morbidity for which care is provided and the procedures carried out at the hospital level. Added to this is the information gleaned from surveys conducted on citizens and the death registries by cause of death.

Despite the rich information which the aforementioned sources provide, other aspects, such as a knowledge of the problem during stages prior to hospitalization or the actions taken by the Primary Care level and by the specialized outpatient level are not covered. Not availing of this information for the National Health System as a whole detracts greatly from an overall comprehension of the approach for dealing with cancer.

Apart from the above, there being no past history of evaluations at the National Health System level for other aspects such as those related to the appropriate coordination, the effectiveness of the organizational models, etc., make the information being even more markedly partial.

Therefore, it will necessary take some time until those gaps considered to be of major importance for contributing to a better knowledge of the problem are bridged so as to be able to pinpoint the best actions to undertake for the purpose of improving this aspect.

This difficulty must but motivate the progress of the work being carried out among all of the players comprising the National Health System.

On one hand, developing the computerized clinical record systems is undoubtedly a key aspect in order to make it possible to obtain data from the records of the care provided on an outpatient basis (PC and visits to specialists).

On the other hand, the discussions held and the agreements which are reached within the strategy Committees will make it possible to approach the more qualitative aspects and to gather ad hoc information necessary for evaluating this Cancer Strategy.

Hence, this strategy evaluation is conceived as the result of combining two main aspects:

- Indicators which can be extracted from the National Health System information system.
- Specific information gathered by means of designing a questionnaire for collecting information following an agreement with the monitoring Committee concerning the items and criteria for completing the questionnaire.

3.2. Indicator table

Indicators, by line of strategy and source of information

Cancer Strategy Evaluation Indicators and agencies or institutions responsible for collecting the information

LINE OF STRATEGY	OBJECTIVE	INDICATOR	SOURCES
1. Health Promotion & Protection	Objective 1	Percentage of ex-smokers	Ministry of Health and Social Policy (Spain’s National Health Survey)
	Objective 2	Percentage of smokers in population over 15 years of age	
	Objective 3	Percentage of smokers in young population (16-24 age range)	
	Objective 4	Average age at which started smoking	
	Objective 5	Prevalence of obesity in childhood and adolescent population (2-17 age range)	
		Prevalence of obesity in adult population (over 17 years of age)	
	Objective 6	Percentage of at-risk drinkers	

Cancer Strategy Evaluation Indicators and agencies or institutions responsible for collecting the information

2. Early Detection	Objective 7a	Degree of participation in the early breast cancer detection program	Spain's screening program network
		Percentage of women who have had a mammogram taken	Ministry of Health and Social Policy (Spain's National Health Survey)
	Objective 7b	Percentage of further testing in view of suspected breast cancer	Spain's screening program network
		Breast cancer detection rate	
	Objective 8	Number of persons evaluated in genetic counseling units (this indicator is also for Objective 11).	Autonomous Communities
	Objective 9	Percentage of women who have had a cytology performed	Ministry of Health and Social Policy (Spain's National Health Survey)
	Objective 10a	Degree of participation in the early colon cancer detection program	Spain's screening program network
		Percentage of individuals with fecal occult blood test measurement taken	Ministry of Health and Social Policy (Spain's National Health Survey)
	Objective 10b	Percentage of fecal occult blood tested positive	Spain's screening program network
		Rate of high-risk adenomas tested	
		Invasive colorectal cancer detection rage	
	Objective 11	Number of individuals evaluated in genetic counseling units (this indicator is also for Objective 8)	Autonomous Communities
3. Adult Care	Objectives 12-17	Evaluation of the quality of the care provided	Audit Ministry of Health and Social Policy
	Objective 18	Percentage of conservative survey in breast cancer	
		Hospital mortality rate following cancer surgery: esophagus, pancreas and lung	Ministry of Health and Social Policy (MBDS)
4. Child & Adolescent Care	Objective 19	Map of pediatric oncology reference units	Ministry of Health and Social Policy Autonomous Communities
5. Palliative Care	Objectives 20-26	Organization of palliative care (description of each Autonomous Community)	Palliative Care Strategy of the Spanish National Health System
		Catalog of specific palliative care facilities	
		Number of beds assigned to palliative care per 1,000 inhabitants	
		Number of research projects funded	
		Percentage of professionals who have received specific basic-level training in palliative care	
		Percentage of professionals who have received specific intermediate-level basic training in palliative care	
		Percentage of professionals who have received specific advanced-level basic training in palliative care	

Cancer Strategy Evaluation Indicators and agencies or institutions responsible for collecting the information

6. Quality of Life	Objective 27	Percentage of hospitals with psychological support units or professionals	Autonomous Communities
		Percentage of patients to whom psychological support has been provided	Audit Ministry of Health and Social Policy
	Objective 28	Percentage of patients who have undergone rehabilitation of the physical and functional sequelae of this illness and its treatments, especially the rehabilitation of lymphedema and the care of ostomies.	Audit Ministry of Health and Social Policy
7. Research	Objective 29	Number of research groups integrated into accredited cooperative networks	Ministry of Science and Innovation (Carlos III Health Institute)
		Number of Spanish publications on cancer in journals with impact factor	Ministry of Health and Social Policy (Spain's National Health Survey)

OVERALL INDICATORS

Cancer mortality rate	Spanish National Institute of Statistics (INE) By Ministry of Health and Social Policy proper
Premature cancer mortality rate	
Cancer incidence rate	Population-based cancer registries National childhood tumor registry
Populational survival rate found following adult cancer	Population-based cancer registries
Population survival rate found following childhood cancer	National childhood tumor registry

3.3. Indicator data by line of strategy

Organic Law 3/2007 of March 22nd for the true equality of males and females sets forth, under Article 27 thereof, the integration of the principle of equality in health policies, explicitly stating that “the data included in the registries, surveys, statistics and other medical and health care information systems shall be obtained and processed broken down by gender, whenever possible.”

In accordance with this requirement, the indicator data for this Cancer Strategy entail the data being obtained broken down by gender in those cases when this is currently possible.

The health care information sources which do not as yet afford the possibility of extracting data broken down by gender must study the implementation of measures which will facilitate this possibility in compliance with the legislation in force.

3.3.1. Health promotion and protection

Objective 1: The prevalence of ex-smokers in Spain (or in any Autonomous Community) must be below 23%, analyzing the difference by sex.

Percentage of ex-smoker

Equation: **(a / b) × 100**
a: Number of individuals age 16 or older who state being ex-smokers at the point in time of the survey
b: Number of individuals age 16 or older who were surveyed
Definitions: For purposes of the evaluation of this strategy, all those individuals who have quit smoking at the point in time of the survey will be considered ex-smokers.
Source: Spain's National Health Survey. Ministry of Health and Social Policy (col. Spanish Sociological Research Center (CIS) / Spanish National Institute of Statistics (INE)).
Breakdown: by Autonomous Community and gender
Periodicity: Depending on when survey is conducted. Percentage of individuals over 15 years of age who state being ex-smokers, compared to the total number of individuals (smokers and ex-smokers) surveyed. For this purpose all individuals who have quit smoking at least one year ago but less than 10 years ago, given that as of 10 years of having quit smoking, they are similar to "non-smokers", are considered ex-smokers.

Objective 2: The prevalence of daily smoking in the adult population (age 16 or older) in Spain (or in any Autonomous Community) is to be lowered to 24% (males 28%, females 20%).

Rate of smokers in population 16 years of age or older

Equation: **(a / b) × 100**
a = Number of individuals age 16 or older who state being smokers at the point in time of the survey.
b = Number of individuals age 16 or older who were surveyed.
Definition: All individuals who smoke tobacco daily, independently of the type and of the amount smoked are considered smokers.
Source: Spain's National Health Survey. Ministry of Health and Social Policy(col. Spanish National Institute of Statistics).
Breakdown: Autonomous Community and gender.
Periodicity: Depending on when the Survey is conducted

Objective 3: The prevalence of smoking in young people (age 16-24) in Spain (or in any Autonomous Community) must be lower than 23%, and an analysis must be made as to whether there is a difference by gender.

Rate of smokers in young population

Equation: **$(a / b) \times 100$**
a = Number of individuals within the 16-24 age range who state being smokers at the point in time of the survey.
b = Number of individuals within the 16-24 age range who were surveyed.
Definition: All those individuals who smoke tobacco daily, independently of the type and the amount smoked, are considered smokers.
Source: Spain's National Health Survey. Ministry of Health and Social Policy (col. Spanish National Institute of Statistics (INE).
Breakdown: Autonomous Community and gender.
Periodicity: Depending on when the Survey is conducted.

Objective 4: Delay the start of tobacco smoking among the age 14-18 population by half a year.

Age at which tobacco smoking started

Equation: Average of the ages stated as to when the tobacco smoking started as stated by the individuals who state being smokers at the point in time of the survey.
Definition: All those individuals who smokes tobacco daily, independently of the amount and type of tobacco is considered a smoker.
Source: Spain's National Health Survey. Ministry of Health and Social Policy (col. Spain's Sociological Studies Institute / Spanish National Institute of Statistics).
Breakdown: Autonomous Community and gender
Periodicity: Depending on when the Survey is conducted

Objective 5: In the Autonomous Communities, the population or risk group interventions are to have been gotten under way for improving the lifestyles, eating habits and physical activity related to cancer. One priority will be to reverse the trend of obesity in childhood and at adult ages.

Prevalence of obesity in young population

Equation: **$(a / b) \times 100$**
a = Number of individuals with in the 2-18 age group with a body mass index considered as being obesity.
b = Total number of persons within that same age range who were surveyed
Definitions: The body mass index (BMI) is calculated based on the weight and height stated on the survey. When equal to or exceeding the cut-off points established in terms of gender and age by Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. (Establishing a standard definition

for child overweight and obesity worldwide: international survey. BMJ 2000; 320: 1-6), obesity will be considered to exist.
Source: Spain's National Health Survey. Ministry of Health and Social Policy (col. Spanish National Institute of Statistics)
Breakdown: Autonomous Community and gender.
Periodicity: Depending on when the Survey is conducted.

Prevalence of obesity in the adult population (over 17 years of age)

Equation: **(a / b) × 100**
a = Number of individuals whose body mass index is considered to be obesity.
b = Total number of individuals who were surveyed.
Definitions: The body mass index (BMI) is calculated based on the weight and height stated by the person surveyed. An individual is considered to be obese if their BMI is 30 Kg/m2 or higher.
Source: Spain's National Health Survey. Ministry of Health and Social Policy (col. Spanish National Institute of Statistics).
Breakdown: Autonomous Community and gender.
Periodicity: Depending on when the Survey is conducted.

Objective 6: Reduce at risk drinking taking into account the gender difference.

Percentage of at risk drinkers

Equation: (a / b) × 100
a = Number of individuals age 16 or older who state drinking alcohol in amounts considered to be a health risk.
b = Number of individuals age 16 or older who were surveyed.
Definitions: Drinking is quantified in terms of the frequency and alcohol intake for the different types of alcoholic beverages, such that an individual who drinks alcohol in quantities entailing a risk to their health when their alcohol intake is equivalent to 40 g/day for the case of males and 20 g/day for the case of females.
The equivalent in grams of alcohol is calculated based on the amount and average alcohol content of each type of beverage.
Source: Spain's National Health Survey. Ministry of Health and Social Policy (col. Spanish National Institute of Statistics).
Breakdown: Autonomous Community, Gender and Age Groups
Periodicity: Depending on when the Survey is conducted

3.3.2. Early detection

Objective 7.a. Early breast cancer detection. Continue carrying out population breast cancer screening programs already being carried out.

Participation in the early breast cancer detection program

Equation: (a / b) × 100
a = Number of females within the 50-69 age range, all inclusive, who are included in an organized, population-based early breast cancer detection program.
b = Number of females to whom this test has been offered.
Definitions: This is the percentage of females (within the 50-69 age range, compared to the total) who have been offered the possibility of taking part in the program and who come in and have the mammogram taken (excluding the exceptions to having the mammogram done which are set out in the criteria for being included in the program).
From the standpoint of accessibility and organization effectiveness of the systems, a female is understood as being included in the coverage when either she has had the mammogram offered actually taken or she has explicitly refused having this test done.
A prior diagnosis of breast cancer or having previously had a mammogram taken for any reasons within a time period of less than two years, whether in the public or private system, is considered to be a criterion for exclusion.
In the case of offering the program to females of ages other than those stipulated for this indicator, the ages in question are to be recorded so as to distinguish them from the others.
Source: Spanish Screening Program Network
Breakdown: Autonomous Community
Periodicity: Annual

Percentage of females who have had a mammogram

Equation: (a / b) × 100
a = Number of females within the 50-69 age range who state having had a mammogram within the two-year period immediately prior to the survey.
b = Total number of females within the 50-69 age range who were surveyed
Definition: All those females who state having had a mammogram are included, specifying the length of time which has elapsed (in years) since the mammogram was taken, independently of whether it was indicated or taken by the public or private health system.

An overall analysis will be provided at the point in time of the evaluation regarding the answers given on the Survey related to mammograms being done, in the regard – for example – of distinguishing the reason why they were taken as well as their relationship with sociodemographic variables which can be obtained from Spain's National Health Survey affording the possibility of delving deeper into the analysis of this preventive practice.

Explicit refusal to have the test done must be stated in writing, these cases not being counted for calculating the indicator.

Source: Spain's National Health Survey. Ministry of Health and Social Policy(col. Spanish National Institute of Statistics).

Breakdown: by Autonomous Community and gender. An overall analysis will be provided at the point in time of the evaluation regarding the answers given on the Survey related to mammograms being done, in the regard – for example – of distinguishing the reason why they were taken as well as their relationship with sociodemographic variables which can be obtained from Spain's National Health Survey affording the possibility of delving deeper into the analysis of this preventive practice.

Objective 7.b. Early breast cancer detection. Promote and consolidate systems for monitoring and evaluating the quality of these programs, enhancing the development of information systems which will make it possible to conduct a combined evaluation as well as an evaluation by individual Autonomous Communities., as well as of the process per se and the impact of these programs according to the standards set out in the European quality control guides.

Percentage of additional tests in view of suspected breast cancer

Equation: **(a / b) × 100**

a = Number of females on who, after having had a screening mammogram, undergo additional examinations confirming or ruling out a diagnosis of suspected breast cancer.

b = Number of females who have had a screening mammogram.

Definitions: Included as examinations in addition to the screening mammogram are echogram, puncture fine needle aspiration and biopsy.

Source: Spanish screening program network.

Breakdown: Autonomous Community.

Periodicity: Annual

Breast cancer detection rate

Equation: **(a / b) × 100**

a = Number of females who, after the tests necessary for the early diagnosis of breast cancer have been conducted, are given confirmation of their diagnosis of having cancer.

b = Number of females on whom screening mammograms have been done.

Definitions: All of the cancers detected are included, regardless of their stage.

Source: Spanish screening program network

Breakdown: Autonomous Community.

Periodicity: Annual

Objective 8: The evaluation of familial risk of cancer will be promoted, including the indication of the evaluation and genetic counseling of those individuals who meet criteria for risk of hereditary cancer.

Number of individuals evaluated at genetic counseling centers

Source: Autonomous Communities

Equation: Absolute number of individuals who have been evaluated in specific genetic counseling units within a one-year period.

Breakdown: Autonomous Community

Periodicity: Every two years.

Objective 9: Early detection of head and neck cancer.

Percentage of females who have had the cytology performed

Equation: (a / b) × 100

a = Number of females within the 30-64 are range who state having had a cytology performed.

b = Total number of females within the 30-64 age range who were surveyed.

Definitions: All of the females who state having had a cytology performed are included, specifying the length of time which has elapsed (in years) since the cytology was performed, independently of whether having been indicated or performed by the public or private health system.

This age group is selected in order to make it possible to collect information on cytologies being performed within at least the five-year period immediately prior to the point in time of the survey.

Source: Spain's National Health Survey (ENSE). Ministry of Health and Social Policy (col. Spanish National Institute of Statistics).

Breakdown: Autonomous Community and gender

An overall analysis will be provided at the point in time of the evaluation regarding the answers given on the Survey related to mammograms being done, in the regard – for example – of distinguishing the reason why they were taken as well as their relationship with sociodemographic variables which can be obtained from Spain's National Health Survey affording the possibility of delving deeper into the analysis of this preventive practice.

The indicator will be analyzed both overall as a whole (30-64 age group) as well as by distinguishing among more specific groups, depending on the periodicity found advisable in each case for performing the cytology).

Periodicity: Depending on when the Survey is conducted.

Objective 10.a: Early colon and rectal cancer detection. Implement colon and rectal cancer screening programs for moderate/low-risk population organized on as a population screening.

Participation in the early colon cancer detection program

Equation: **(a / b)× 100**

a = Number of individuals within the 50-69 age range who come in and have the fecal occult blood test done.

b = Number of individuals within the 50-69 age range to whom the possibility of having this test done was offered.

Definitions: Having been diagnosed with colon cancer or having had a colonoscopy within the last 3 years are considered exceptions to having the screening test done.

Explicit refusal to have the test done must be put into writing, these cases not being counted for calculating the indicator.

Source: Spanish screening program network.

Breakdown: Autonomous Community

Periodicity: Annual

Percentage of individuals who have had fecal occult blood test measurement taken

Equation: (a / b) × 100

a = Number of individuals within the 50-69 age range who state having had a fecal occult blood test done.

b = Total number of individuals within the 50-69 age range who were surveyed.

Definition: All those individuals who state having had a fecal occult blood test done by way of any of the available methods within the two-year period immediately prior to the survey are included.

Source: Spain's National Health Survey (ENSE). Ministry of Health and Social Policy (col. Spanish National Institute of Statistics).

Breakdown: Autonomous Community and by gender. An overall analysis will be provided at the point in time of the evaluation regarding the answers given on the Survey related to mammograms being done, in the regard – for example – of distinguishing the reason why they were taken as well as their relationship with sociodemographic variables which can be obtained from Spain's National Health Survey affording the possibility of delving deeper into the analysis of this preventive practice.
Periodicity: Depending on when the Survey is conducted.
Remarks: There being no other questions on Spain's National Health Survey prior to the revision of the Cancer Strategy made in 2009, in the new edition of which colon cancer screening is stipulated, the decision has been made for this aspect to be added in the upcoming edition.

Objective 10.b: Establish systems for monitoring and evaluating the quality of these programs, enhancing the development of information systems which will make it possible to conduct a combined evaluation as well as an evaluation by individual Autonomous Communities., as well as of the process per se and the impact of these programs according to the standards set out in the European quality control guides.

Percentage of fecal occult blood tests which tested positive

Equation: (a / b) × 100
a = Number of individuals within the 50-69 age range in who tested positive for the fecal occult blood test.
b = Total number of individuals who took the screening test.
Source: Spanish screening program network
Breakdown: Autonomous Community
Periodicity: Annual
High-risk adenoma detection rate
Equation: (a / b) × 100
a = Number of individuals within the 50-69 age range in whom, after having taken the screening test and all of the other tests necessary for confirming a diagnosis, a high-risk adenoma is found to exist.
b = Total number of individuals on whom the screening test was done.
Source: Spanish screening program network.
Breakdown: Autonomous Community
Periodicity: Annual

Invasive colorectal cancer detection rate

Equation: (a / b) × 100
a = Number of individuals within the 50-69 age range in whom, after having taken the screening test and all of the other tests necessary for con-

firming a diagnosis, invasive colon/rectal cancer is found to exist.**b =** Total number of individuals on whom the screening test was done.

Source: Spanish screening program network
Breakdown: Autonomous Community
Periodicity: Annual

Objective 11: Promote the evaluation of familial risk of cancer, including the indication of conducting study and genetic counseling of those individuals who fulfill the criteria of hereditary risk of cancer for those syndromes for which diagnostic tests are available and which are clinically applicable (non-polyposic colon syndrome and familial adenomatous polyposis)

Number of persons evaluated in genetic counseling units

Source: Autonomous Communities
Equation: Absolute number of individuals who have been evaluated in specific genetic counseling units within a one-year period
Breakdown: Autonomous Community
Periodicity: Every two years

3.3.3. Adult care

The evaluation of this aspect will be carried out, on one hand, by means of conducting a study making it possible, by way of audits, to obtain quality information on the care-providing process. On the other hand, the results found in the indicators which are detailed at a further point in this document.

Objectives 12-17: In the patients with a well-found suspicion of breast cancer and colorectal cancer, the process of confirming the diagnosis is to be started within the two-week period immediately following the suspicion having been established.

Evaluation of the quality of the care provided

This study is set out as a continuation, expanding the participation, of the project "Development of indicators of process and results and evaluation of the oncological care provided" which was conducted in 2008 as a result of the agreement with funding by the Ministry of Health and Social Policy and carried out by the Avedis Donabedian University Institute under a working agreement signed with the "Agència d'Avaluació de Tecnologia i Recerca Mèdiques" [Agency for the Evaluation of Medical Research and Technology] (AATRM) in collaboration with the scientific societies and the master plans of the respective Autonomous Communities.

A brief description if provided hereinbelow of the variables of this study, which was focused on patients with breast, colorectal and lung cancer, a more detailed explanation regarding the criteria and methodology of which can be referenced in the specific document concerning the conducting of the study.

The evaluation of the following aspects will be included:

a) At the individual hospital level:
- Check to ensure that a multidisciplinary care-providing protocol is in place. To this end, the protocol concept and the requirements which must comprise the same will be defined. Similarly, this protocol must be distinguished from other types of documents, such as the clinical practice guides or other guides. The protocol will be evaluated for breast, colorectal and lung cancers.
- Assess the intervention of the tumor Committee(s) in the aforementioned tumors, evaluating the following parameters:
- Number of cases at the hospital in question which have been assessed by said Committees.
- Documented record of this evaluation (preferably with a copy thereof in the clinical record).

b) Aspects to be evaluated by means of the record made thereof on the clinical records audited:

b.1 Breast cancer
- Record of prior radiology report
- Preoperative histological study made
- Record of anatamopathology report and TNM
- Diagnosis–to–treatment time lapse from anatomopathology confirmation up to undergoing the first treatment.
- Indication and selective biopsy of the sentinel ganglion (SBSG) performed.
- Type of surgery (conservative or otherwise) in terms of the stage.
- Indication and performing of lymphadenectomy >= 10 ganglia.
- Record of systemic hormone treatment
- Cases of repeat interventions following conservative surgery having been performed.
- Existence of physical therapy / rehabilitation of lymphedema consultation room.
- Psychological support provided.

b.2 Colon and rectal cancer
- Complete colon study conducted
- Baseline CEA test
- Extension study conducted
- Record of anatomopathology report

  - Diagnosis–to–treatment time lapse (in days) from the anatomopathology findings up to the first treatment undergone.
  - Existence of surgical wound infection
  - Existence of suture failures
  - Systemic treatment. Coadjutant hemotherapy in colon cancer
  - Indication and performing of radiation treatment in rectal cancer
  - Conservation of anal sphincter in rectal cancer
  - Stomatherapy consultation made for ostomized patients
  - Psychological support provided

c) Other indicators

Objective 18: Evaluation of the care–providing process: evaluate the mortality rate of the complex surgical procedures performed for curative purposes in esophageal, stomach, pancreatic, rectal and lung cancer, neuro–oncology and liver metastasis.

Percentage of conservative surgery in breast cancer

Equation: **(a / b) × 100**
a =Number of releases with conservative surgical procedure.
b = Total number of releases with any surgical procedure for removal of breast cancer.
Definitions: An evaluation will be made of all those females whose main diagnosis is of a malignant breast neoplasia who have undergone surgery by means of a surgical procedure not entailing a radical or modified mastectomy (such as a segmentectomy, quadratectomy, tumorectomy), compared to the total number of females who have undergone any breast surgery procedure.
For the numerator, a segmentectomy, quadratectomy or tumorectomy are considered as being conservative surgery: ICD–9MC procedure codes 85.20 to 85.23 and 85.25 and main diagnosis of malignant breast neoplasia (174.X).
For the denominator, all of the surgical procedures for removal of breast tissue and mastectomies (codes 85.2X, 85.34 to 85.36, 85.4X) and main diagnosis of breast cancer must be taken into account.
This includes the procedures performed with a hospital admission and those performed by means of outpatient surgery.
Source: Hospital release registry (MBDS). Ministry of Health and Social Policy.
Breakdown: Autonomous Community
Periodicity: Annual

Hospital mortality rate following surgery for:

a. Esophageal cancer
b. Pancreatic cancer
c. Lung cancer
d. Liver metastasis

To calculate these indicators, an analysis is made of those cases in which, after having undergone surgery for the aforementioned problems, the person dies in the hospital within the 30–day period immediately following the surgical intervention.

Equation: **(a / b) × 100**

a = Number of releases due to death within the one–month period immediately subsequent to cancer surgery (for each process selected).

b = Total number of surgical procedures performed (for each process selected).

Definitions: All of the releases including the following international classification of diseases (ICD) codes, version 9–MC) are included:

- Esophageal cancer:
  - diagnoses: 150; 150.0; 150.1; 150.2; 150.3; 150.4; 150.5; 150.8 y 150.9
  - procedures: 42.3; 42.31; 42.32; 42.33; 42.39; 42.4; 42.40; 42.41 y 42.42
- Pancreatic cancer:
  - diagnoses: 157; 157.0; 157.1; 157.2; 157.3; 157.4; 157.8 y 157.9
  - procedures: 52.2; 52.21; 52.22; 52.5; 52.51; 52.52; 52.53; 52.59; 52.6 y 52.7
- Lung cancer:
  - diagnoses: 162; 162.0; 162.2; 162.3; 162.4; 162.5; 162.8 y 162.9
  - procedures: 31.5; 32; 32.0; 32.01; 32.09; 32.1; 32.2; 32.21; 32.22; 32.28; 32.29; 32.3; 32.4; 32.5; 32.6 y 32.9
- Liver metastasis:
  - diagnoses: 197.7
  - procedures: 50.2, 50.21, 50.22, 50.29, 50.3 y 50.4

For the numerator, these same codes will be taken into account, to which the death criterion as a reason for release is added.

Source: Hospital release records (MBDS). Ministry of Health and Social Policy.

Breakdown: Autonomous Community and gender.

Periodicity: Annual

3.3.4. Child and adolescent care

Objective 19. Child and adolescent care of the individuals diagnosed with cancer is to be provided in multidisciplinary oncology units fostering psychosocial and educational care as of the point in time of the diagnosis which will allow them to continue their maturing development and their education.

Reference pediatric oncology units

Equation: Qualitative indicator of identification and site
Definitions: Including information regarding the location of these units, considered as such in terms of compliance with a number of standards, one of the main ones of which are these related to the number of cases diagnosed and treated Annually (at least 30) or that they be the sole reference for an entire Autonomous Community.
At least the following will be noted for each one thereof: name, hospital where located, postal address and scope of action.
Source: Autonomous Communities and prepared by the Ministry of Health and Social Policy proper
Breakdown: Entire National Health System as a whole

3.3.5. Palliative care

Objective 20. To provide the patients who are in an advanced terminal stage and their family members with an evaluation and integral care adapted at all times to their situation at any level of care throughout the full length of the process of their evolution.
Objective 21. Provide the patients who have an illness in the advanced/terminal stage with care based on the best practices and scientific evidence available.
Objective 22. Avail of an explicit organizational model so that the patients will be provided with palliative care according to their needs and at the appropriate point in time, adapted to the different territorial boundaries and situations.
Objective 23. To set up an organizational system which will guarantee the coordination among the different health care and social resources and will promote integrated actions.
Objective 24. To foster the application of bioethics principles and the participation of the patients in their process in accordance with the principles, values and contents of the Law of Patient Autonomy and the legislation in force in the different Autonomous Communities.
Objective 25. To establish continuing training programs which are specifically for the health system professionals to enable them to adequately meet the needs of the patients with an illness in the advanced/terminal stage and their family members
Objective 26. To step up research in palliative care

Organization of palliative care

Descriptive report on the overall organization as a whole which each Autonomous Community has planned for providing palliative care.
Source: Autonomous Communities

Directory of specific palliative care facilities

Identification and description of the basic functions of the different types of specific facilities in existence in the Autonomous Communities for providing this care.
A directory including the location of each one of these facilities will be prepared.
Source: Autonomous Communities

Number of beds assigned to palliative care per 1,000 inhabitants

Equation: **$(a / b) \times 1{,}000$**
a = Number of hospital beds currently is used which are assigned exclusively to palliative care within a one–year period.
b =Population for that same year.
Definitions: Including all those beds used exclusively for palliative care, independently of the Service or Unit to which they are assigned. Those beds which are for general use or which are assigned to other main functions are not included, even though patients with this condition may sometimes be provided with care in these beds.
Source: Autonomous Communities in an initial stage and Statistics of the Health Care Establishments with Confinement (EESCRI).
Breakdown: Autonomous Community.
Periodicity: Annual
Number of research projects funded
Equation: Number of research projects concerning palliative care publicly funded within a one–year period.
Definitions: Including all those projects which have been carried out by means of official Health Care Administration funding systems, be they central government systems (through the Carlos III Health Institute) or Autonomous Community systems.
Those projects newly approved each year will be included, independently of when they are stipulated to end.
Sources: Carlos III Health Institute (Ministry of Technology and Innovation) and Autonomous Community Information Systems
Breakdown: None, all of the National Health System as a whole
Periodicity: Annual
Percentage of professionals who have taken specific basic–level training in palliative care

Equation: **(a × 100) / b**
a = Number of professionals who have taken training specifically focused on palliative care, basic–level, within a one year period.
b = Total number of professionals in that same year
Definitions: Basic–level training is considered as being taking specific courses totaling 20–40 hours in length.
Including all those training measures of these characteristics which have been accredited by the respective Autonomous Community.
Source: Information systems of the Autonomous Communities
Breakdown: By Autonomous Communities and by type of professional (physician, nursing, psychologist, social worker or others) and field of work (primary care teams, home support teams and similar, hospital).
Periodicity: Annual
Percentage of professionals who have taken specific intermediate–level training in palliative care
Equation: **(a × 100 / b)**
a = Number of professionals who have taken intermediate–level training specifically in palliative care within a one–year period.
b = Total number of professionals for that same year
Definitions: Intermediate–level training is considered as being:
- Forty to eighty–hour accredited courses
- Third–level courses (doctorate–level)
- One to two–month stints in Palliative Care Units
- Includes all those training actions of these characteristics which have been accredited by the respective Autonomous Community.

Source: Information systems of the Autonomous Communities.
Breakdown: By Autonomous Community, by type of professional and where working
Periodicity: Annual.
Percentage of professionals who have taken specific advanced–level training in palliative care
Equation: **(a × 100 / b)**
a = Number of professionals who have taken specific advanced–level training in palliative care within a one–year period.
b = Total number of professionals for that same year.
Definitions: The following is considered to be advanced–level training:
- Master’s Courses
- Stints of 3 months or longer in Palliative Care Units

Including all those training actions of these characteristics which have been accredited by the respective Autonomous Community.
Source de information: Information systems of the Autonomous Communities.

Breakdown: By Autonomous Community, by type of professional and where working.
Periodicity: Annual.

3.3.6. Quality of life

Objective 27: Provide psychological care and social assistance for cancer patients and their family members, according to their needs, based on the scientific evidence available regarding the effectiveness of the interventions.

Percentage of hospitals which have psychological support units or professionals

Equation: **(a / b) × 100**
a = Number of hospitals which provide integral cancer treatment, which avail of professionals specifically devoted to providing psychological support for cancer patients as well as the weekly schedule worked at each hospital.
b = Number of cancer patients for whom care was provided.
Source: Autonomous Community.
Breakdown: Autonomous Community.

Percentage of patients to whom psychological support has been provided

Equation: **(a / b) × 100**
a = Number of cancer patients to whom specific psychological support is provided (comprising part of the hospital care process).
b = Number of cancer patients for whom care is provided at the hospitals.
Definitions: All those cancer patients on whose clinical record there is an annotation of psychological support having been provided for them.
Source: Audit of clinical records from the National Health System “Study of the Adult Cancer Patient Hospital Care Processes”.
Breakdown: Entire National Health System as a whole
Objective 28: Promote the rehabilitation for the physical and functional sequelae of this illness and its treatments. Special emphasis must be placed on the rehabilitation of lymphedema and the care of ostomies.
Percentage of patients who have undergone rehabilitation of the physical and functional sequelae of this illness and its treatments, especially the rehabilitation of lymphedema and the care of ostomies.
Source: Audit of clinical records from the National Health System “Study of the Adult Cancer Patient Hospital Care Processes”.
Breakdown: Entire National Health System as a whole

3.3.7. Research

Objective 29: Enhance the networks of cancer research centers and /or groups of excellence which are interconnected in a coordinated, cooperative manner. Additionally foster the creation and consolidation of stable, solid research groups integrated into accredited networks by enhancing the assigning of specific resources and spaces for carrying out their work within the framework of the health research institutes accredited by the Carlos III Health Institute (ISCIII).

Research groups integrated into accredited cooperative Networks

Number of groups within hospital or health care centers evaluated and integrated into the Thee–Based Cooperative Research Networks accredited by the Carlos III Health Institute (ISCIII).

These Theme–Based Cooperative Research Networks include a varying number of biomedical research groups of a multidisciplinary nature operating under the different public Administrations or in the private sectors which pertain to a minimum of four (4) Autonomous Communities, the objective of which is that of carrying out cooperative research projects in the general interest. It is necessary to get groups of at least five (5) centers together.

Source: Carlos III Health Institute. Ministry of Science and Innovation (MICNN).

Breakdown: Entire National Health System as a whole.

Periodicity: Annual

Number of Spanish publications on cancer with an impact factor

Equation: Impact factor of Spain's scientific publications

Definitions: An assessment will be made of the number of scientific publications on cancer published in journals which have an impact factor as of 2006 (considered baseline) up to the end of the following evaluation period of the Strategy.

Source: Review of reference sources cited in bibliographies.

Breakdown: None. Entire National Health System as a whole.

Periodicity: Annual.

OVERALL INDICATORS

Cancer mortality rage

Equation: $(a / b) \times 100{,}000$

a =Number of deaths caused by cancer within a one–year period.

b = Population for that same year

Definitions: The cause of death codes of the International Classification of Diseases employed for selecting the main causes of death, one of which is cancer, are those proposed by the Atlanta Centers for Disease Control and Prevention.

The rates are calculated adjusted by age, using the European population as the standard population.

The C00–C97 codes of the International Classification of Diseases ICD–10 are used.

Source: Deaths, by cause of death. Spanish National Institute of Statistics. Ministry of Health and Social Policy.

Spanish National Institute of Statistics current population estimates.

Breakdown: Autonomous Community and gender.

Periodicity: Annual.

Premature deaths due to cancer

Equation: (a / b) × 100,000

a = Number of deaths caused by cancer in individuals of less than 75 years of age within a one–year period.

b = Population under 75 years of age.

Definitions: The deaths include the causes of death classified under the C00–C97 codes of the International Classification of Diseases ICD–10. The rates are calculated adjusted by age, using the European population as the standard population.

Source: Deaths, by cause of death. Spanish National Institute of Statistics. Ministry of Health and Social Policy.

Spanish National Institute of Statistics estimates.

Breakdown: Autonomous Community and gender.

Periodicity: Annual

Cancer incidence rate

Equation: (a / b) × 100,000

a =Number of new cancer cases diagnosed within a one–year period.

b =Population for that same year.

Definitions: All of the specific types of tumors and cases according to the anatompathological classification and coding system approved by the International Agency for Research on Cancer (IARC).

Both gross and adjusted rates are calculated.

Source: Population–based cancer registries of the Autonomous Communities and Spain's National Childhood Tumor Registry.

Current Spanish National Institute of Statistics population estimates.

Breakdown: Autonomous Community, Tumor Groups and gender

Periodicity: Depending on the information available

Population–based survival rate following adult cancer

Equation: **(a / b) × 100**

a = Number of cases of cancer diagnosed who die of cancer within a five–year time lapse subsequent to time of diagnosis.
b = Number of individuals diagnosed with cancer within the same year.
Definitions: All those cases of individuals who, having been diagnosed with cancer, are still alive five years immediately subsequent to the cancer diagnosis are counted.
Source: Population–based cancer registries of the Autonomous Communities
Breakdown: None. Entire National Health System as a whole
Periodicity: Depending on the information available
Population–based survival rate following childhood cancer
Equation: **(a / b) × 100**
a = Number of cancer cases diagnosed who die due to cancer within a five–year time lapse subsequent to time of diagnosis
b =Number of individuals diagnosed with cancer within the same year.
Definitions: All those cases of individuals who, having been diagnosed with cancer, are still alive five years immediately subsequent to the cancer diagnosis are counted.
Source: Spanish National Childhood Tumor Registry
Breakdown: None. Entire National Health System as a whole
Periodicity: Depending on the information available

4. Index of Abbreviations and Acronyms

AATRM	Agència d'Avaluació de Tecnologia i Recerca Mèdiques [Agency for the Evaluation of Medical Technology and Research]
AC	Autonomous Communities
ADF	Avedis Donabedian Foundation
AICR	American Institute for Cancer Research
AETS	Agencia de Evaluación de Tecnologías Sanitarias [Spanish Healthcare Technologies Evaluation Agency]
BMI	Body Mass Index
CAIBER	Consorcio de Apoyo a la Investigación Biomédica en Red [Spanish Clinical Research Network]
CIBER	Centro de Investigación Biomédica en Red [Clinical Research Network Center]
CIFC	Cancer Incidence in Five Continents
MBDS	Minimum Basic Data Set. National Health System General Hospital Release Registry
COM	Comisión de las Comunidades Europeas
CSE	Comité de Seguimiento y Evaluación de la Estrategia [Strategy Monitoring and Evaluation Committee]
CSIC	Consejo Superior de Investigaciones Científicas [Spanish National Research Council]
ECRM	European Cancer Research Managers Forum
EDADES	Encuesta Domiciliaria sobre Alcohol y Drogas en España [Spanish National Household Survey on Alcohol and Drugs]
EESCRI	Estadística de Establecimientos Sanitarios con Régimen de Internamiento [Statistics on Healthcare Establishments with Hospitalization]
ENCR	European Network of Cancer Registries
ENSE	Encuesta Nacional de Salud en España [Spain's National Health Survey]
ERSPC	European Randomized Study of Prostate Cancer
EU	European Union
FAO	Food and Agriculture Organization
FESEO	Federación de Sociedades Españolas de Oncología [Federation of Spanish Oncology Societies]
G4	International Alliance for Regenerative Medicine
GNP	Gross National Product

HPV	Human Papilomavirus
IARC	International Agency for Research on Cancer
ICD	International Classification of Diseases
ICGC	International Cancer Genome Consortium
INE	Instituto Nacional de Estadística [National Institute of Statistics]
ISCIII	Carlos III Health Institute (Ministry of Science and Innovation)
MICINN	Ministerio de Ciencia e Innovación [Ministry of Science and Innovation]
MHSP	Ministerio de Sanidad y Política Social [Ministry of Health and Social Policy]
NAOS	Estrategia para la Nutrición, Actividad Física y Prevención de la Obesidad [Strategy for Nutrition, Physical Activity and Prevention of Obesity]
NCI	National Cancer Institute
NICE	National Institute for Clinical Excellence
PLCO	Prostate, Luna, Colon, Ovary Trial
PRO	Public Research Organizations
RD	Royal Decree
R+D+i	Research, Development and Innovation
RETICs	Redes Temáticas de investigación cooperativa sanitaria [Theme-Based Cooperative Health Care Networks]
RINCAM	Registro de Incidencia y Mortalidad por Cancer en Medicina General [Registry of Cancer Incidence and Mortality in General Medicine]
RNTI	Registro Nacional de Tumores Infantiles [Spanish National Childhood Tumor Registry]
RTICC	Red Temática de Investigación cooperativa de Centros de Cancer [Theme-Based Cooperative Cancer Research Center Network]
SENC	Sociedad Española de Nutrición Comunitaria [Spanish Society of Community Nutrition]
SEOM	Sociedad Española de Oncología Médica [Spanish Medical Oncology Society]
SEHOP	Sociedad Española de Hematología y Oncología Pediátricas [Spanish Pediatric Hematology and Oncology Society]
SEOR	Sociedad Española de Oncología Radioterápica [Spanish Radiation Therapy Society]
SIOP	International Society of Pediatric Oncology
SNS	Sistema Nacional de Salud [National Health System]
EU27	27-Member State European Union
US	United States
WCRF	World Cancer Research Foundation
WHO	World Health Organization

5. Bibliography

5.1. Situation of Cancer in Spain

Agudo A, Ahrens W, Benhamou E, Benhamou S, Boffetta P, Darby SC, Forastiere F, Fortes C, Gaborieau V, Gonzalez CA, Jockel KH, Kreuzer M, Merletti F, Pohlabeln H, Richiardi L, Whitley E, Wichmann HE, Zambon P, Simonato L (2000) Lung cancer and cigarette smoking in women: a multicenter case-control study in Europe. Int J Cancer 88: 820-827.

Armstrong K, Calzone K, Stopfer J, FitzGerald G, Coyne J, Weber B (2000) Factors associated with decisions about clinical BRCA1/2 testing. Cancer Epidemiol Biomarkers Prev 9: 1251-1254.

Ascunce N, Barcos A, Ederra M, Erdozain N, Murillo A, Osa A, Mellado M (2004) [Breast cancer screening program. Results of the process and impact indicators (1990-2002)]. An Sist Sanit Navar 27: 319-333.

Ascunce N, Ederra M, Barcos A, Zubizarreta R, Fernández AB, Casamitjana M (2007) Situación del cribado de cancer de breast en España:características y principales resultados de programas existentes. In Descripción del cribado del cancer en España. Proyecto DESCRIC, Castells X, Sala MAN, et al. (eds) pp 31-73. Ministerio de Sanidad y Consumo, Agéncia d'Avaluació de Tecnologia i Recerca Mèdiques de Catalunya: Madrid & Barcelona.

Blot WJ (1997) Vitamin/mineral supplementation and cancer risk: international chemoprevention trials. Proc Soc Exp Biol Med 216: 291-296.

Blot WJ, Fraumeni JF, Jr. (1976) Geographic patterns of lung cancer: industrial correlations. Am J Epidemiol 103: 539-550.

Brenner H, Rothenbacher D, Arndt V (2009) Epidemiology of stomach cancer. Methods Mol Biol 472: 467-477.

Coleman MP, Gatta G, Verdecchia A, Esteve J, Sant M, Storm H, Allemani C, Ciccolallo L, Santaquilani M, Berrino F (2003) EUROCARE-3 summary: cancer survival in Europe at the end of the 20th century. Ann Oncol 14 Suppl 5: v128-v149.

Curado.M.P., Edwards B, SHR, Storm.H., FJ, HM, and Boyle.P. (2007) Cancer Incidence in Five Continents. IARC,CancerBase No 160. Lyon.

ECO-OEC. European Cancer Observatory, Observatoire Européen du Cancer. International Agency for Research on Cancer, Lyon . 2009. International Agency for Research on Cancer, Lyon. 15-5-2009.

Ferlay J, Autier P, Boniol M, Heanue M, Colombet M, Boyle P (2007) Estimates of the cancer incidence and mortality in Europe in 2006. Ann Oncol 18: 581-592.

Ferlay, J., Bray, F., Pisani, P., and Parkin, D. M. GLOBOCAN 2002: Cancer Incidence, Mortality and Prevalence Worldwide. IARC CancerBase No. 5. version 2.0, IARCPress, Lyon. 2004.

Ferlay J, Randi G, Bosetti C, Levi F, Negri E, Boyle P, La Vecchia C (2008) Declining mortality from bladder cancer in Europe. BJU Int 101: 11-19.

Fernandez dL-B, Alvarez-Martin E, Morant-Ginestar C, Genova-Maleras R, Gil A, Perez-Gomez B, Lopez-Abente G (2009) Burden of disease due to cancer in Spain. BMC Public Health 9: 42.

Fernandez E, Schiaffino A, Borras JM, Shafey O, Villalbi JR, La Vecchia C (2003) Prevalence of cigarette smoking by birth cohort among males and females in Spain, 1910-1990. Eur J Cancer Prev 12: 57-62.

Giovannucci E, Michaud D (2007) The role of obesity and related metabolic disturbances in cancers of the colon, prostate, and pancreas. Gastroenterology 132: 2208-2225.

Gispert R, Gervas J, Librero J, Bares M (2007) [Criteria to define the list of causes of avoidable mortality: an unavoidable discussion]. Gac Sanit 21: 177-178.

Hankinson SE DK (2006) Ovarian cancer. In Cancer Epidemiology and Prevention. Schottenfeld F (ed) pp 1013-1023. Oxford University Press: New York.

Johnson-Thompson MC, Guthrie J (2000) Ongoing research to identify environmental risk factors in breast carcinoma. Cancer 88: 1224-1229.

Karim-Kos HE, de Vries E, Soerjomataram I, Lemmens V, Siesling S, Coebergh JW (2008) Recent trends of cancer in Europe: a combined approach of incidence, survival and mortality for 17 cancer sites since the 1990s. Eur J Cancer 44: 1345-1389.

Key TJ, Verkasalo PK, Banks E (2001) Epidemiology of breast cancer. Lancet Oncol 2: 133-140.

Levi F, Lucchini F, Negri E, Franceschi S, La Vecchia C (2000) Cervical cancer mortality in young women in Europe: patterns and trends. Eur J Cancer 36: 2266-2271.

Lo AC, Soliman AS, El Ghawalby N, Abdel-Wahab M, Fathy O, Khaled HM, Omar S, Hamilton SR, Greenson JK, Abbruzzese JL (2007) Lifestyle, occupational., and reproductive factors in relation to pancreatic cancer risk. Pancreas 35: 120-129.

López-Abente G, Pollán M, Aragonés N, Pérez-Gómez B, Hernández V, Lope V, Suárez B, Cardaba M, Cerdá T, Salas D. La situación del cancer en España. Ministerio de Sanidad y Consumo. Madrid, 2005.

Lopez-Abente, G., Pollan, M, Escolar, A., Errezola, M., and Abraira, V. Atlas de mortalidad por cancer y otras causas en España, 1978-1992. Instituto de Salud Carlos III. 2001. Madrid.

Mannetje A, Kogevinas M, Chang-Claude J, Cordier S, Gonzalez CA, Hours M, Jockel KH, Bolm-Audorff U, Lynge E, Porru S, Donato F, Ranft U, Serra C, Tzonou A, Vineis P, Wahrendorf J, Boffetta P (1999) Occupation and bladder cancer in European women. Cancer Causes Control 10: 209-217.

Michaud DS (2004) Epidemiology of pancreatic cancer. Minerva Chir 59: 99-111.

Ministerio de Sanidad. Spain's National Health Survey de España. Ministerio Sanidad y Consumo de España. 2006. 24-3-2009.

Morgan GP (1995) Epidemiology of oesophageal cancer. J R Soc Med 88: 119.

Muggia F, Lu MJ (2003) Emerging treatments for ovarian cancer. Expert Opin Emerg Drugs 8: 203-216.

Nelen V (2007) Epidemiology of prostate cancer. Recent Results Cancer Res 175: 1-8.

Parkin DM, Whelan SL, Ferlay J, Storm H (2005) Cancer Incidence in Five Continents. IARC,CancerBase No 7. Lyon.

Perez-Gomez B, Aragones N, Pollan M, Suarez B, Lope V, Llacer A, Lopez-Abente G (2006) Accuracy of cancer death certificates in Spain: a summary of available information. Gac Sanit 20 Suppl 3: 42-51.

Peris M, Espinas JA, Munoz L, Navarro M, Binefa G, Borras JM (2007) Lessons learnt from a population-based pilot programme for colorectal cancer screening in Catalonia (Spain). J Med Screen 14: 81-86.

Peris-Bonet R (2008) Incidencia y supervivencia del cancer infantil. Rev Esp Pediatria 64: 342-356.

Pike MC, Wu AH, Spicer DV, Lee S, Pearce CL (2007) Estrogens, progestins, and risk of breast cancer. Ernst Schering Found Symp Proc 127-150.

Pollan M (2001) [Breast cancer in women and occupation. A review of the evidence]. Gac Sanit 15 Suppl 4: 3-22.

Pollan M, Ramis R, Aragones N, Perez-Gomez B, Gomez D, Lope V, Garcia-Perez J, Carrasco JM, Garcia-Mendizabal MJ, Lopez-Abente G (2007) Municipal distribution of breast cancer mortality among women in Spain. BMC Cancer 7: 78.

Robinson KE, Gerhardt CA, Vannatta K, Noll RB (2009) Survivors of childhood cancer and comparison peers: the influence of early family factors on distress in emerging adulthood. J Fam Psychol 23: 23-31.

Roder DM (2002) The epidemiology of gastric cancer. Gastric Cancer 5 Suppl 1: 5-11.

Rodriguez-Rieiro, C., Aragones, N., Pollan, M., Lopez-Abente, G., and Perez-Gomez, B. Temporal trend of the cervical cancer mortality rates among regions in Spain: 1975-2004. Medicina Clínica In press. 2009.

Ross RK (1996) Epidemiology of prostate cancer and bladder cancer: an overview. Cancer Treat Res 88: 1-11.

Salas-Trejo D, Peris-Tuser M, Espinás JA, Perez-Riquelme F (2007) Situación del cribado de cancer colorrectal en España. In Descripción del cribado del cancer en España. Proyecto DESCRIC, Castells X, Sala MAN, et al. (eds) pp 31-73. Ministerio de Sanidad y Consumo, Agéncia d'Avaluació de Tecnologia i Recerca Mèdiques de Catalunya: Madrid & Barcelona.

Sant M, Allemani C, Santaquilani M, Knijn A, Marchesi F, Capocaccia R (2009) EUROCARE-4. Survival of cancer patients diagnosed in 1995-1999. Results and commentary. Eur J Cancer 45: 931-991.

Silverman DT, Hartge P, Morrison AS, Devesa SS (1992) Epidemiology of bladder cancer. Hematol Oncol Clin North Am 6: 1-30.

Stiller CA, Marcos-Gragera R, Ardanaz E, Pannelli F, Almar ME, Canada MA, Steliarova-Foucher E (2006) Geographical patterns of childhood cancer incidence in Europe, 1988-1997. Report from the Automated Childhood Cancer Information System project. Eur J Cancer 42: 1952-1960.

Winawer SJ, St John J, Bond J, Hardcastle JD, Kronborg O, Flehinger B, Schottenfeld D, Blinov NN (1990) Screening of average-risk individuals for colorectal cancer. WHO Collaborating Centre for the Prevention of Colorectal Cancer. Bull World Health Organ 68: 505-513.

World Cancer Research Fund / American Institute for Cancer Research. Food, Nutrition, Physical Activity and the Prevention of Cancer: a Global Perspective. AICR. 2007. Washington DC.

5.2. Health Promotion and Protection

Aranceta Bartrina J, Serra-Majem Ll, Pérez Rodrigo C, Llopis González J, Mataix Verdú J, Ribas Barba L, Tojo R, Tur Marí JA. «Las vitaminas en la alimentación de losespañoles. Estudio eVe. Análisis en población general». En Aranceta J, Serra-MajemLl, Ortega R, Entrala A, Gil A (eds). Las vitaminas en la alimentación de losespañoles. Estudio eVe. Madrid: Panamericana 2000: 49-94.

Aranceta J, Pérez Rodrigo C, Serra Majem Ll, Ribas Barba L, Quiles Izquierdo J, Vioque J, Tur Marí JA, Mataix Verdú J, Llopis González J, Tojo R, Foz Sala M y Grupo Colaborativo para el Estudio de la Obesidad en España. Prevalencia de obesidad en España: Estudio SEE-DO'2000. Med Clin (Barc) 2003; 120: 608-612.

Banegas Banegas JR, Díez Gañán L, Rodríguez Artalejo F, González Enríquez J, Graciani Pérez-Regadera A, Villar Álvarez F. Cada vez son más: 56.000 muertes atribuibles al tabaquismo en España en 1998. Med Clin (Barc) 2001; 117: 692-4.

Bingham SA, Day NE, Luben R et al (2003). Dietary fibre in food and protection against colorectal cancer in the European prospective Investigation into Cancer and Nutrition (EPIC): an observational study. Lancet; 361: 1496-1501.

Bosch FX, Ribes J. The Epidemiology of primary liver cancer: global epidemiology. En Viruses and liver cancer. Tabor E (ed). Rotterdam, Elsevier Science, 2000 p, 87-16.

Boyle P, Autier P, Bartelink H, Baselga J, Boffetta P et al (2003). European Code Against Cancer and scientific justification: third version (2003). Annals of Oncology 14: 973-1005.

COM (Comisión de las Comunidades Europeas) (2003). Una estrategia europea de salud y medio ambiente. Bruselas 2003.

Doll R, Peto R. Epidemiology of cancer. In: Wheatherall DJ, Ledingham JGG, Warell DA (eds). Oxford textbook of medicine. Oxford: Oxford University Press, 1996: 197-221.

Fernández E, Schiaffino A, García M, Saltó E, Villalbí JR, Borràs JM. Prevalencia del consumo de tabaco en España entre 1945 y 1995. Reconstrucción a partir de las Encuestas Nacionales de Salud. Med Clin (Barc) 2003; 120(1): 14-6.

Gilmore A, Nolte E, McKee M, Collin J. (2002). Continuing influence of tobacco industry in Germany. Lancet 360: 1255-6.

Gundgaard J, Nielsen JN, Olsen J, Sorensen J Increased intake of fruit and vegetables: estimation of impact in terms of life expectancy and healthcare costs. Public Health Nutr 2003; 6: 25-30.

Gutierrez-Fisac JL, Banegas Banegas JR, Rodríguez Artalejo F, Regidor E. Increa- sing prevalence of overweight and obesity among Spanish adults, 1987- 1997. Int J Obes Relat Metab Disord 2000; 24: 1677-82.

Harnack L, Nicodemus K, Jacobs DR, Folson AR. An evaluation of the Dietary Guidelines for Americans in relation to cancer occurrence. Am J Clin Nutr 2002; 76: 889-896.

Hill MJ. Diet, physical activity and cancer risk. Public Health Nutr 1999; 2: 397- 402.

Hillsdon M, Thorogood M. A systematic review of physical activity promotion strategies. Br J Sports Med 1996; 30: 84-89.

IARC. (2002). Tobacco smoke and involuntary smoking. IARC Monographs on evaluation of carcinogenic risks to human. Vol 83. Lyon.

Jha P, Chaloupka (eds) (2000). Tobacco. Control in developing Countries. Oxford. Oxford University Press.

Kafatos AG, Codrington CA (eds). Nutrition and diet for healthy lifestyles in Europe: The Eurodiet project. Public Health Nutr, 2001; 4: 265- 436.

Key TJ, Allen NE, Spencer EA, Travis RC. The effect of diet on risk of cancer. Lancet 2002 Sep 14; 360(9336): 861-868.

Lubchenco J. (1998). Entering the century of the environment: a new social contract for science, Presidential address to the American Association for the Advancement of Science, 15 th February 1997. Science 491-497.

Maqueda Blasco J, De la Orden V, Kauppinen T, Toikkanen J, Pedersen D, Young R et al (1998). Occupational exposure to carcinogens in Spain 1990-1993: preliminary results. Helsinki Institute of Occupational Health. Citado en Lopez-Abente G (2003). Plan Integral del Cancer. Situación del cancer en España. ISCIII, cap 9.

Ministére de la Santé. (2003) Cancer. Une mobilisation national., tous ensemble. Cap. 2: prevention des facteurs de risque. France.

Ministerio de Sanidad y Cosumo (1997). Spain's National Health Survey 1997.

Ministerio de Sanidad y Consumo (2001). Alcohol y Salud Pública en España.

Ministerio de Sanidad y Consumo (2003). Spain's National Health Survey 2001.

Ministerio de Sanidad y Consumo (2003). Plan Nacional de Prevención y Control del Tabaquismo 2003-2007.

Ministerio de Sanidad y Consumo. Plan Nacional Contra la Droga, 2003.

Oficina Regional para Europa de la OMS. Plan Europeo de Actuación sobre Alcohol 2000-2005.

Olea N, Pazos P, Expósito J. (1998) Inadvertent exposure to xenoestrogens. Eur. J.: Cancer Prev.; 7 (sup.1): 517-523.

OMS. Oficina Regional Europea. Plan de Acción Europeo Contra el Alcohol (2000-2005).

OMS. Oficina Regional Europea. Primer Plan de Acciones Estratégicas de Dieta y Nutrición (2002-2005).

OMS. Proyecto de Convenio Marco de la OMS para el Control del Tabaco. Marzo 2003.

Pomerleau J, McKee M, Lobstein T, Knai C. The burden of disease attributable to nutrition in Europe. Public Health Nutr 2003; 6: 453-461.

Riboli E, Lambert R (eds) (2003). Nutrition and lifestyle: opportunities for cancer prevention. IARC scientiphic publication n.º 156. IARC. Lyon.

Robledo T, Gil E. Alcohol y cancer. Jano, 1998; 54 (1240): 45-47.

Roe L, Hunt P, Bradshaw H, Rayner M. Health promotion interventions to promote healthy eating in the general population. A review. London: Health Education Authority, 1997.

Schottenfeld D, Fraumeni J (eds) (1996). Cancer Epidemiology and Prevention. New York: Oxford University Press.

Serra-Majem Ll, Aranceta J, Ribas L, Pérez Rodrigo C. Epidemiología de la obesidad infantil y juvenil en España. Resultados del estudio enKid (1998- 2000). En: Serra-Majem Ll, Aranceta Bartrina J (eds). Obesidad infantil y juvenil. Estudio enKid. Barcelona: Masson, 2001: 81-108.

Serra-Majem Ll, Ribas Barba L, Pérez Rodrigo C, Román Viñas B, Aranceta Bartrina J. Hábitos alimentarios y consumo de alimentos en la población infantil y juvenil española (1998-2000): variables socioeconómicas y geográficas. Med Clin (Barc) 2003; 121: 126-131.

Siegel M. (2002). The Effectiveness of state-level tobacco control intervention: a review of program implementation and behavioural outcomes. Annu Rev Public Health 23: 45-71.

Silagy C, Stead LF (2003). Physician advice for smoking cessation (Cochrane Review). The Cochrane Library, Issue 1. Oxford: Updated Software.

Silagy C, Lancaster T, Stead L, Mant D, Fowler G, (2000). Nicotine Replacement therapy for smoking cessation (Cochrane Review). The Cochrane Library. Issue 4, 2000. Oxford: Updated Software.

Situación del cancer en España, capítulos 4 y 5. Madrid: Instituto de Salud Carlos III, 2003.

Sociedad Española de Nutrición Comunitaria. Guías alimentarias para la población española. Recommendations para una dieta saludable. Madrid: IM&C-SENC, 2001: 1-502.

Stockley L, Sjöstrom M on behalf of Eurodiet Working Party 3. Toward public health nutrition strategies in the European Union to implement food based dietary guidelines and to enhance healthier lifestyles. Public Health Nutr 2001; 4: 307-324.

The NHS Cancer Plan. NHS. 2000.

Van't Veer P, Jansen MC, Klerk M, Kok FJ. Fruits and vegetables in the prevention of cancer and cardiovascular disease. Public Health Nutr 2000; 3: 103-107.

WHO. Diet, nutrition and the prevention of chronic diseases. Report of a Joint FAO/WHO Expert consultation. WHO Technical report series 916. WHO: Geneva, 2003.

William GM, Williams CL, Weisburger JH (1999). Diet and cancer prevention: the fiber first diet. Toxicol Sci 52: 72-86.

Witte K, Allen M (2000). A Meta-analysis of fear appeals: implications for effective public health campaigns. Health Education and Behaviour. 27: 245-50 (citado en Cancer. Una mobilisation national 2003).

World Cancer Research Fundation (WCRF) (1997). Food, nutrition and the prevention of cancer: a global perspective. Washington, DC. WCRF, American Institute for Cancer Research.

5.3. Early Detection

AETS. Agencia de Evaluación de Tecnologías Sanitarias. Ministerio de Sanidad y Consumo. Instituto de Salud Carlos III. Cribado poblacional de cancer de breastmediante mamografía. Diciembre de 1995.

AETS. Agencia de Evaluación de Tecnologías Sanitarias. Instituto de Salud Carlos III. Ministerio de Sanidad y Consumo. Uso de la mamografía y de la citología de Papanicolau para la detección precoz del cancer de breast y de cérvix uterino en España. Informe de Evaluación nº 34, noviembre de 2002.

AETS. Instituto de Salud Carlos III. Ministerio de Sanidad y Consumo. Resultados de investigación sobre evaluación de tecnologías sanitarias: diagnóstico precoz y clínico en oncología. Informe de Evaluación nº 32, noviembre de 2002.

AETS. Agencia de Evaluación de Tecnologías Sanitarias. Instituto de Salud Carlos III. Ministerio de Sanidad y Consumo. Evaluación de la efectividad de tecnologías para la promoción de la salud y prevención de la enfermedad. Informe de Evaluación nº 36, diciembre de 2002.

Aitken JF, Elwood JM, Lowe JB, Firman DW, Balada KP, Ring I. A randomised trial of population screening for melanoma. J Med Screen 2002; 9:33-7.

Andriole G, Grubb R, Buys S et al Mortality results from a randomized prostate-cancer screeningtrialNew England Journal of Medicine 2009;360:1310-9.

Armstrong K, Moye E, Willians S, Berlin JA et Reynolds EE. Screening mammography in women 40 to 49 years of age: A systematic review for the American College of Physicians. Ann Intern Med 2007;146: 516-526.

Avalia-t. Axencia de Avaliación de Tecnologías Sanitarias de Galicia. Cribado decancer de cérvix. Métodos convencionales y nuevos métodos. Revisión de la evidencia para su posible implantación en Galicia. Septiembre 2002.

Avalia-t. Axencia de Avaliación de Tecnologías Sanitarias de Galicia. Evaluación de la eficacia y efectividad del cribado poblacional del cancer colorrectal Aplicabilidad en el Sistema Nacional de Salud. INF 2003/02.

Barton MB. Breast cancer screening. Benefits, risks, and current controversies. Postgrad Med. 2005;118(2):27-6, 46.

Baxter N, with the Canadian Task Force on Preventive Health Care. Preventive Health Care, 2001 update: Should women be routinely taught breast selfexamination to screen for breast cancer? CMAJ 2001; 164: 1837-46.

Borrás JM, Espinàs JA, Castells X. La evidencia del cribado del cancer de breast: la historia continua. Gac Sanit 2003; 17: 249-55.

Boyle P et al European Code Against Cancer and scientific justification: third version (2003). Annals of Oncology 14: 973-1005.2003.

Canadian Task Force on Preventive Health Care. 2002. http://.ctfphc.org

Cierco Peguera P, González Enríquez J, Melús Palazón E, Bellas Beceiro B, Marian Nuin Villanueva, Marzo Castillejo M. Prevención del cancer. Actualizaciones2003. Aten Primaria 2003: vol 32, suppl 2, 45-56.

Comisión de las Comunidades Europeas. Propuesta de Recomendación del Consejo sobre cribado del cancer. Bruselas, 5.5.2003.

Harbin, M, Anttila A, Jordan J. Ronco R, Schenck U, Segnan N, Wiener HG, Herbert A, Daniel J, Von Karsa L. European guidelines for quality assurance in cervical cancer screening. Second edition. European Commission Directorate-General for Health and Consumer Protection. 2008.

Curry S J, Byers T, Hewwitt M. Fulfilling the potencial of Cancer Prevention and Early Detecction. Nacional Cancer Policy Board NCPB), Institute of Medicine (IOM). The National Academies Press.2003.

http://www.nap.edu/books/0309082544/html/R1.html

Deck W, Kakuma R. Screening Mammography: A Reassessment. Agence d'évaluation des technologies et des modes d'intervention en santé (AETMIS). (AETMIS 05-03). Montréal: AETMIS, 2006, xii-77 p.

Descripción del Cribado del Cancer en España, Proyecto DESCRIC. Plan Nacional para el SNS del Ministerio de Sanidad y Consumo 2007. Iruretagoiena M, Cantero D, Asua J. Revisión de la evidencia científica: cribado mamográfico del cancer de breast. Evaluación de Tecnologías Sanitarias. OSTEBA- Departamento de Sanidad. Gobierno Vasco.

Descripción del Cribado del Cancer en España, Proyecto DESCRIC. Plan Nacional para el SNS del Ministerio de Sanidad y Consumo 2007. Andradas E, Blasco JA, Calcerrada N, Valentín B. Revisión de la evidencia científica: del cribado del cancer colorrectal en población de riesgo medio.

Dos Santos Silva I. Epidemiología del cancer: principios y métodos. Agencia Internacional de Investigación sobre el Cancer. IARC Press 1999.

European Parliament Resolution. "Breast Cancer in the European Union", OJ C 68 E (18.03.2004): 611.

Fletcher SW. Screening average risk women for breast cancer. UpToDate 2006. Disponible en: www.uptodate.com

Fraser CG, Matthew CM, Mowat NA, Wilson JA, Carey FA, Steele RJ. Immunochemical testing of individuals positive for guaiac faecal occult blood test in a screening programme for colorectal cancer: an observational study. Lancet Oncol. 2006 Feb;7(2):127-31.

Freedberg KA, Geller AC, Miller DR, Lew RA, Koh HK. Screening for malignant melanoma: A cost-effectiveness analysis. J Am Acad Dermatol 1999; 41 (5Pt 1): 738-45.

Gabe R, Duffy SW. Evaluation of service screening mammography in practice: the impact on breast cancer mortality. Ann Oncol. 2005;16 Suppl 2:ii153-ii162.

Gotzsche PC, Nielsen M. Screening for breast cancer with mammography. Cochrane Database of Systematic Reviews 2006, Issue 4. Art. No.:CD001877.DOI: 10.1002/14651858.CD001877.pub.2.

Guittet L et alComparison of a guaiac-based anda n immunochemical fecal occult test in screening for colorectal cancer in a general average-risk population.Gut pubhlished online 4 Aug 2006.

Hailey D. Digital mammography: an update (Issues in emerging health technologies issue 91). Ottawa: Canadian Agency for Drugs and Technologies in Health:2006.

Helfand M, Mahon SM, Eden KB, Frame PS, Orleans CT. Screening for skin cancer. Am J Prev Med 2001; 20: 47-58.

Hewitson P, Glasziou P, Irwig L, Towler B, Watson E Detección del cancer colorrectal con la prueba de sangre oculta en materia fecal (Hemoccult) (Revisión Cochrane traducida). En: La Biblioteca Cochrane Plus, 2008 Número 4. Oxford: Update Software Ltd. Disponible en: http://www.update-software.com. (Traducida de The Cochrane Library, 2008 Issue 3. Chichester, UK: John Wiley & Sons, Ltd.).

Humphrey LL, Helfand M, Chan BK, Woolf SH. Breast cancer screening: a summary of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med 2002; 137(5 Part 1): 347-60.

IARC. Internacional Agency for Research on Cancer. Breast Cancer Screening.IARC Handbooks of Cancer Prevention Vol 7. IARC Press 2002. http:// breast-cancer-research.com/content/pdf/bcr616.pdf. IARC. Internacional Agency for Research on Cancer convencional Monograph 2005 (en prensa).
http://www.iarc.fr/ENG/Press_Releases/pr151a.html.255

Jöns K. Report on breast cancer in the European Union. European Parliament. Sesion Document A5-0159/2003.

Launoy GD, Bertrand HJ, Berchi C, Talbourdet VY, Guizard AV, Bouvier VM et al Evaluation of an immunochemical fecal occult blood test with automated reading in screening for colorectal cancer in a general average-risk population International Journal of Cancer 2005;115(3):493-6.

Martín J, Gonzalez J. Estrategias de detección precoz en España. Rev Esp SaludPública 1991; 65 (4): 281-85.

MAS. Medical Advisory Secretariat Computed tomographic colonography (virtual colonoscopy). Toronto: Ontario Ministry of Health and Long-Term Care. 2003.

Moss SM, Cuckle H, Evans A et al Effect of mammographic screening from age 40 years on breast cancer mortality at 10 years' follow-up: a randomised controlled trial Lancet. 2006;368(9552):2053-2060.

NICE Computed tomographic colonography (vitual colonoscopy). Interventional Procedure Guidance 129. 2005.

OSTEBA. Departamento de Sanidad del Gobierno Vasco. «Detección precoz del cancer de próstata (Proyecto INAHTA)», 2002.

Perry et al European guidelines for quality assurance in breast cancer screening and diagnosis. Fourth Edition. Health & Consumer Protection Directorate-General Ford Edition. European Commission, 2006.

Pisano ED, Gatsonis C, Hendrick E et al Diagnostic performance of digital versus film mammography for breast-cancer screening. N Engl J Med. 2005;353(17):1773-1783.

Prorok PC, Andriole GL, Bresalier RS, Buys SS, Chia D, Crawford ED et al Design of the Prostate, Lung, Colorectal and Ovarian (PLCO) Cancer Screening Trial Control Clin Trials 2000 Dec; 21(6 Suppl): 273S-309S.

Ruano Raviña A. Susceptibilidad al cancer de breast y Ovary asociado a los genes BRCA1 y BRCA2. Santiago de Compostela: Servicio Galego de Saúde.Axencia de Avaliación de Tecnoloxías de Galicia, Avalia-t, 2002. Informes de evaluación: INF 2002/03.

Sankila R, Démaret M, Hakama M, Lynge E, Shouten lJ, Parkin DM. Evaluation and monitoring of screening programmes. European Comission. Europe Against Cancer Programme. Brussels-Luxembourg, 2000.

Sawaya GF, McConnnell KJ, Kulasingam SL, Lawson HW, Kerlikoswske K, Melnikow J, Lee NC, Gildengorin G, Myers ER and Washington AE. Risk of Cervical Cancer Associated with Extending The Interval between Cervical- Cancer Screenings. N Engl J Med 2003 Vol 349; 16; 1501-1509.

Schröder FH, Bangma CH. The European Randomized Study of Screening for Prostate Cancer (ERSPC). Br J Urol 1997 Mar; 79 Suppl 1: 68-71.

Schöeder F, Hugosson J, Roobol M. Screening and prostate-cancer mortality in a randomized European study. New England Journal of Medicine 2009;360:1320-8.

Segnan N, Senore C, Andreoni B, Aste H, Bonelli L, Crosta C et al Baseline findings of the Italian multicenter randomized controlled trial of "once-only sigmoidoscopy"—SCORE.Journal of the National Cancer Institute 2002; 94(23):1763-72.

Skaane P, Skjennald A, Young K, Egge E, Jebsen I, Sager EM et al Follow-up and final results of the Oslo I Study comparing screen-film mammography and full-field digital mammography with soft-copy reading. Acta Radiol 2005;46(7):679-89.

UK Flexible Sigmoidoscopy Screening Trial Investigators. Single flexible sigmoidoscopy screening to prevent colorectal cancer: baseline findings of a UK multicentre randomised trial Lancet 2002; 359: 1291-300.

US Preventive Services Task Force, 2002.
http://www.preventiveservices.ahrg.gov

Viikki M, Pukkala E, Hakama M. Risk of cervical cancer after a negative Pap smear. J. Med Screen 1999(6): 565-9.

Vis AN, Hoedemaeker RF, Roobol M, van Der Kwast TH, Schroder FH. Tumor characteristics in screening for prostate cancer with and without rectal examination as an initial screening test at low PSA (0.0-3.9 ng/ml). Prostate. 2001 Jun 1; 47(4): 252-61.

Walsh J, Terdiman J. Colorectal Cancer Screening. Scientific Review. JAMA,March 12, 2003 Vol 289, No. 10.

Weissfeld JL, Schoen RE, Pinsky PF, Bresalier RS, Church T, Yurgalevitch S et al Flexible sigmoidoscopy in the PLCO cancer screening trial: results from the baseline screening examination of a randomized trial Journal of the National Cancer Institute 2005;97(13):989-97.

Wilson JMG, Jungner G. Principles and practice of screening for disease. Public Health Papers n.º 34. Geneve: World Health Organisation, 1968.

5.4. Adult Care

Borrás JM, Boyd A, Martinez-Villacampa M, Colomer R, Brunet J, Germà JR. Lessons learned in the implementation of a cancer care network in Catalona. J Management and Marketing in Health Care 2009; 2:174-183.

Carlow DR. The British Columbia Cancer Agency: a comprehensive and integrated system of cancer control. Hospital Quarterly 2001 (spring): 1-19.

Charles C, Whelan T, Gafni A. What do we mean by partnership in making decision about treatment. BMJ 1999; 319: 780-2.

Choy H (ed). Recent advances in combined modality therapy for solid tumors. Seminars in Oncology 2003; 30 (supl 9): 1-121.

Coebergh JW, Sant M, Berrino F, Verdechia A (eds). Survival of adult cancer patient in Europe diagnosed from 1978-198: The EUROCARE II study group. Eur J Cancer 1998; 34: 2137-71.

Coleman MP, Alexe DM, Albrecht T, Mckee M (eds). Responding to the challenge of cancer in Europe. Ljubljana: Institute of Public Health, 2008.

Disponible en: www.who.eu/observatory

Coulter A. Patient information and shared decision making in cancer care. Br J Cancer 2003; 89(supl 1): 15-16.

De Vita V, Hellman S, Rosenberg SA (eds). Principles and practice of oncology. Baltimore: Lippincto Willians and Wilkins, (6 th ed), 2001.

Esco R, Palacios A, Pardo J, Biete A, Carceller JA, Veiras C et al Infraestructure of radiotherapy in Spain: a minimal standard of radiotherapy resources. Int J Radiat Oncol Biol Phys 2003; 56: 319-27.

Extramural Committee to assess measures of progress in cancer. Measures of progress against cancer. JNCI 1990; 82: 825-35.

Fawzy FI. Psychosocial interventions for patients with cancer: What works and what doesn't. Eur J Cancer 1999; 35: 1559-64.

FESEO: Libro Blanco de la Oncología en España. Madrid, Editorial JIMS, 1988.

FESEO: Segundo Libro Blanco de la Oncología en España. Madrid, 1994.

FESEO: Tercer Libro Blanco de la Oncología en España. Madrid, 2002.

Fleissig A, Jenkins V, Catt S, Fallowfield L. Multidisciplinary teams in cancer care: are they effective in the UK? Lancet Oncol 2006; 7:935-43.

Guveia J, Coleman M, Haward R et al Improving cancer control in the European Union. Eur J Cancer 2008; 44:1457-62.

Haward R, Amir Z, Borrell C, Bawson J, Sailly J, West M, Sainsbury R. Breast cancer teams: the impact of constitution, new cancer workload and methods of operation on their effectiveness. Br J Cancer 2003; 89: 15-23.

Hewitt M, Petiti D (eds). Interpreting the volume-outcome relationship in the context of cancer care. Washington, DC: National Academies Press; 2001.

Hillner BE, Smith TC, Desch CE. Hospital and physician volume or specialization and outcomes in cancer treatment importance in quality of cancer care. J Clin Oncol 2000; 18: 2327-40.

Hillner B. Is cancer care best at high-volume providers? Curr Oncol Rep 2001; 3(5): 404-9.

Institute of Medicine. Ensuring quality of cancer care: Washington: National Academy Press, 1999.

Institute of Medicine. Cancer care for the whole patient: meeting psychosocial needs. Washington: The national academies press, 2008.

Izquierdo A, Viladiu P, Borrás JM, Moreno V, Catalán G. La percepción del cancer y de su prevención en mujeres de Girona. Med Clin 1996; 107: 14-9.

Jensen OM, Parkin DM, McLennan R, Muir CS, Sheet RG (eds). Cancer Registration: Principles and methods. Lyon: International Agency for Research on Cancer, 1999.

Kaarjalinen J, Palva I. Do treatment protocols improve end results? A study of survival of patients with multiple myeloma in Finland. BMJ 1989; 299: 1069-72. 258.

Karim Kos H, de Vries E, Soerjormataram I et al Recent trends of cancer in Europe: a combined approach of incidence, survival and mortality for 17 cancer sites since 1990s. Eur J Cancer 2008; 44:1345-89.

Kunkler IH. Managed clinical networks: a new paradigm for clinical medicine. J Royal Coll Physicians 2002; 34: 230-33.

Lee JJ, Earle CC, Weeks JC. Outcomes research in oncology: history, conceptual framework and trends in literature. JNCI 2000; 92: 195-204.

Livingston M, Woods K. Evaluating managed clinical networks for cancer services in Scotland. Int, J Integrated Care 2003; 3; (june): 1-16.

Martínez Pérez JA, Alonso JM, Albert V. Cancer y medicina de familia. Madrid: SEMER GEN, 2002.

McClellan M, McGinnis M, Nobel E, Olsen L. Evidence based medicine and the changing nature of health care. Washington: The national academies press, 2008.

O'Connor AM, Rostom A, Fiset V, Tetroe J, Entwistle V, Llewelyn-Thomas H et al Decision aids for patients facing health treatment or screening decisions: systematic review. BMJ 1999; 319: 412-15.

Oncoguías-Guías de práctica clínica. Barcelona: Acadèmia de Ciències Mèdiques de Cataluña y Balares, Agencia d'Avaluació de Tecnologia Mèdica i Recerca i Pla Director d'Oncologia, 2003.

Pérez G, Porta M, Borrell C et al Interval from diagnosis to treatment onset for six major cancers in Catalonia (Spain). Cancer Detect Prev 2008; 32:267-75.

Peris M, Espinas JA, Bustins M, Escobedo A, Borràs JM, Puig X. Variaciones en la utilización de la cirurgía conservadora de breast por paciente, características del hospital y región: un análisis multinivel. Rev. Oncología 2001; 03(03): 137-41.

Pla R, Pons JMV, González JR, Borràs JM. Hi ha nivells assistencials en cirurgia oncològica? Els que més en fan, ho fan millor? Informe sobre la relació entre volum de procediments i resultats en cirurgia. Barcelona: Agència d'Avaluació de Tecnologia i Recerca Mediques, 2003.

Pla R, Pons JMV, Gonzalez JR, Borras JM. ¿Influye en el proceso y en los resultados el volumen de procedures en la cirugía del cancer? Análisis basado en datos clínico-administrativos. Cir Esp 2004; 75:179-88.

Porta M, Fernández E, Alguacil J. Semiology, proteomics and the early detection of cancer. J Clin Epidemiol 2003; 56: 815-9.

Sant M, Aaxaleid T, Berrino F et al EUROCARE 3: survival of cancer patients diagnosed 1990-94 results and commentary. Ann Oncol 2003; 14 (sup5): v61-v118.

Sant M, Allemani M Santaquilani M et al EUROCARE 4 : survival of cancer patients diagnosed in 1995-1999 : results and commentary. Eur J Cancer 2009; 45:931-99.

SEOM. Libro blanco de la oncología médica. Madrid: SEOM, 2005.

SEOR. Libro blanco de la oncología radioterápica en España. Madrid: SEOR, 2009 (en prensa).

Smith TC, Hillner BE, Desch CE. Efficacy and cost-effectiveness of cancer treatment: rational allocation of resources based on decision analysis. JNCI 1993; 85: 1460-73.

Smith TJ, Hillner BE. Ensuring quality of cancer care by the use of clinical practice guidelines and clinical pathways. J Clin Oncol 2001; 19: 2886-97.

Smith TJ, Hillner BE, Bear HD. Taking action the volume quality relationship: How long can we hide our heads in the colostomy bag?. JNCI 2003; 95: 695-7.

Viladiu P (ed). Els registres hospitalaris de cancer. Barcelona: Departament de Sanitat i Seguretat Social, 1993.

Wright FC, Langer B, Hunter A. Multidisciplinary cancer conferences: a systematic review and development of practice standards. Eur J Cancer 2007: 43:1002-10.

Woolf S. The meaning of translational research and why it matters. JAMA 2008; 299:211-3.

5.5. Child and Adolescent Care

Comunicación de la Comisión al Consejo, al Parlamento Europeo y al Comité Económico y social europeo. Estrategia europea de medio ambiente y salud. Bruselas, 11-6-2003.

Guidelines for the Pediatric Cancer Center and role of such centers in diagnosis and treatment (RE9705). American Academy of Pediatrics. Section on Haematology/Oncology. Pediatrics, 99(1): 139-141, 1997.

Knudson AG: Cancer genetics through a personal retroscope. Genes, Chromosomes and cancer 2003. 38(4): 228-291.

Ley 41/2002 de 14 de Noviembre de 2202, básica reguladora de la autonomía del paciente y de derechos y obligaciones en materia de información y documentación.

Peris, R. Registro Nacional de Tumores Infantiles (RNTI-SEHOP) estadísticas básicas 4. 1980-2001. Supervivencia 1980-1997. 2003.

Peris Bonet R. Incidencia y supervivencia del cancer infantil. Rev Esp Pediatr, 2008; 64(5): 342-56.

Robison LL, Amstrong GT, boice JD et al.: The Childood Cancer Survivor Study: A National Cancer institute sponsored resource for outcome and intervention research. JCO, 2009.

Smith MA, Gloecker A. Childhood cancer: incidence, survival and mortality. En: Principles and Practice of Pediatric Oncology. Pp:1-12. Ed: Pizzo & Poplack. 2002.

Stiller CA, Marcos Gragera R, Ardanaz E, et al Geographical patterns of childhood cancer incidence in Europe, 1988-1997. Report from the Automated Childhood Cancer Informations System project. EJC, 2006; 42(13): 1952-60.

Thaxter, G., Stevens, M., Craft, M. et al ICCCPO Executive Committee; Childhood Cancer - Guidelines for Standards of Treatment & Care. Adopted by SIOP, Porto, September 2002.

5.6. Quality of Life

Berger AM, Sankaranarayanan J, Watanabe-Galloway S. Current methodological approaches to the study of sleep disturbances and quality of life in adults with cancer: a systematic review. Psychooncology. 2007;16(5):401-20.

Bloom JR, Petersen DM, Kang SH. Multi-dimensional quality of life among long-term (5+years) adult cancer survivors. Psychooncology. 2007;16(8):691-706.

Bottomley A. The Cancer Patient and Quality of Life. The Oncologist 2002;7:120-125.

Catt S, Chalmers A, Fallowfield L. Psychosocial and supportive-care needs in high-grade glioma. Lancet Oncol. 2008;9(9):884-91.

Costa-Requena G, Gil F Quality of life in the chemotherapy treatment of Spanish cancer patients: a comparison of general population norms. Psychooncology. 2009 Jan 9.

Derogatis LR, Morrow GR, Fetting J et al. (1983) The prevalence of psychiatric disorders among cancer patients J Amer Med Assoc, 249:751-757.

Die M, Calvo F, Berasategui P y Perez JM (1998) Psico-Oncologia asistencial en Oncología integral Criterios de integraciónj, objectives de actividad y experiencia inicial en el Hospital General Universitario Gregorio Marañón. Oncología, 21(6):155-164.

Die Trill M y Holland J (1995) A model curriculum for training in psycho-oncology. Psycho-Oncology, 4:169-182.

Evan EE, Zeltzer LK. Psychosocial dimensions of cancer in adolescents and young adults. Cancer. 2006;107(7 Suppl):1663-71.

Frick E, Tyroller M, Panzer M. Anxiety, depression and quality of life of cancer patients undergoing radiation therapy: a cross-sectional study in a community hospital outpatient centre. Eur J Cancer Care, 2007;16(2):130-6.

Helms RL, O'Hea EL, Corso M. Body image issues in women with breast cancer. Psychol Health Med. 2008;13(3):313-25.

Holland J y Murillo M (2003). Historia Internacional de la Psico-Oncología. En M Die Trill (ed), Edit ADES (Aula de Estudios Sanitarios), Madrid,

Jacobsen PB, Jim HS. Psychosocial interventions for anxiety and depression in adult cancer patients: achievements and challenges. CA Cancer J Clin. 2008;58(4):214-30.

Massie MJ Prevalence of depression in patients with cancer. J Natl Cancer Inst Monogr. 2004;(32):57-71.

Massie MJ y Holland HC (1989) Overview of of normal reactions and prevalence of psychatric disorders. En Handbook of Psycho-Oncology: Psychological Care of the Patient with Cancer. JC Holland y J Rowland (eds) Oxford Univ Press, NY.

Pasetto LM, Falci C, Compostella A, Sinigaglia G, Rossi E, Monfardini S. Quality of life in elderly cancer patients. Eur J Cancer. 2007;43(10):1508-13.

Roth AJ, Weinberger MI, Nelson CJ. Prostate cancer: psychological implications and management. Future Oncol. 2008;4(4):561-8.

Rowland JH. Cancer survivorship:rethinking the cancer control continuum. Semin Oncol Nurs. 2008;24(3):145-52.

Sheard T, Maguire P. The effect of psychological interventions on anxiety and depression in cancer patients: result of two meta-analysis. British Journal of Cancer 1999;80:1770-80.

Stark D, Kiely M, Smith A, Velikova G, House A, Selby P. Anxiety disorders in cancer patients: Their nature, associations, and relation to quality of life. Journal of Clinical Oncology 2002;20:3137-48.

Stein KD, Syrjala KL, Andrykowski MA. Physical and psychological long-term and late effefcts of cancer. Cancer. 2008; 112(11 Suppl):2577-92.

Tanvetyanon T, Soares HP, Djulbegovic B, Jacobsen PB, Bepler G. A systematic review of quality of life associated with standard chemotherapy regimens for advanced non-small cell lung cancer. J Thorac Oncol. 2007; 2(12):1091-7.

Wedding U, Pientka L, Höffken K. Quality of life in elderly patients with cancer: a short review. Eur J Cancer. 2007;43(15):2203-10.

Zabora J, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S. The prevalence of psychological distress by cancer site. Psycho-oncology 2001;10(1):19-28.

5.7. Research

Acción CRECE. Guinovart, J. et al (2005).
www.cosce.org/crece.htm

Adams JM and Cory S. Transgenic models of tumor development. Science 1991; 254: 1161- 167.

Berns A. Cancer. Improved mouse models. Nature 2001; 410: 1043-1044.

Berrino F.; De Angelis R.; Sant M.; Rosso S.; Lasota M.B.; Coebergh J.W. et al Survival for eight major cancers and all cancers combined for European adults diagnosed in 1995-99: results of the EUROCARE-4 study Lancet Oncology 2007,8:773-783.

Bhujwalla Z, Artemov D, Ballesteros P, Cerdán S, Gillies RJ, Solaiyappan M. Combined vascular and extracellular pH imaging of solid tumors. NMR in Biomed. 2002; 15: 114-9.

Camí J, Suñén E, Méndez-Vásquez R. Mapa bibliométrico de España 1994-2002: Biomedicina y Ciencias de la Salud. Med Clin (Barc) 2005; 124: 93-101.

Informe previo publicado y disponible en:
http://bibliometria.prbb.org/MapaBiomedico2002

Barcelona: IMIM-ISCIII, 2004.

Camí J, Méndez-Vásquez RI, Suñén-Pinyol E. Evolución de la productividad científica de España en Biomedicina (1981-2006). Redes 2008;10: 24-9.

Carrasco, M. Génesis e implantación de la investigación biomédica en red", (2008), Redes de Investigación en Medicamentos, 10:34.

Clancy C and Lawrence N. Is outcomes research on cancer ready for prime time. Med Care 2002; 40 (Supl): 92-100.

Clarke AR. Manipulating the germline: its impact on the study of carcinogenesis. Carcinogenesis 2000; 21: 435-441.

Coleman M. New drugs and survival: does the Karolinska report make sense?. CANCER WORLD. SEPTEMBER-OCTOBER 2006 Pag.26-35.

CICYT (Comisión Interministerial de Ciencia y Tecnología) (2007), Estrategia Nacional de Ciencia y Tecnología.

http://sise.fecyt.es/Noticias_Home/Encyt.pdf

de Álava E. La investigación biomédica y su impacto sobre el sistema sanitario español. Panorama Social "Las claves de la sanidad futura: Investigación y Gestión". No. 7 Pág. 84-95. 2008. Fundación de las Cajas de Ahorro (FUNCAS).

Echhouse S., Lewison G. and Sullivan R. Investment and Outputs of cancer Research: from the Public Sector to Industry. The Second Cancer Resarch Funding Survey. September 2007 Ed. European Cancer Research Managers Forum (ECRM). www.ecrmforum.org

Estela C. Acceso a nuevos fármacos oncológicos en Europa: el debate generado por el informe Karolinska. Farm. Hosp. 2007; 31: 1-2.

Estrategia en Cancer del Sistema Nacional de Salud. Ministerio de Sanidad y Consumo. 2006.

Estrategia Regional contra el Cancer en Castilla y León. Consejería de Sanidad y Bienestar Social Dirección General de Planificación Sociosanitaria. Junta de Castilla y León. 2005.

FESEO. Tercer Libro Blanco de la Oncología. Federación de Sociedades Españolas de Oncología (Biete Solá et al., autores). FESEO, Madrid, 2002.

Golub TR, Slonim DK, Tamayo P, Huard C, Gaasenbeek M, Mesirov JP, Coller H, Loh ML, Downing JR, Caligiuri MA et al Molecular classification of cancer: class discovery and class prediction by gene expression monitoring, Science 1999; 286: 531-7.

Hanahan D and Weinberg RA. The hallmarks of cancer. Cell 2000; 100: 57-70. 269.

Harkin DP. Uncovering functionally relevant signaling pathways using microarray-based expression profiling. Oncologist 2000; 5: 501-7.

Hoover RN. Cancer - Nature, nurture or both. New Engl J Med 2000; 343: 135-6.

Investigación sobre el Cancer en la UE. Boletín "Europa al día" Diciembre 2007 No. 242. Oficina internacional Consejo General de Colegios Oficiales de Médicos de España. http://www.cgcom.es

Informe Cotec 2008: Tecnología e Innovación en España (2008) Fundación Cotec para la Innovación Tecnológica.
http://www.cotec.es

Informe SISE 2007. Comisión Interministerial de Ciencia y Tecnología. http://sise.fecyt.es/sise-public-web

Jensen OM, Parkin DM, MacLennan R, Muir CS, Skeet RG (eds). Cancer Registration Principles and Methods. IARC Scientific Publications, n.º 95. Lyon, 1991.

Kononen J, Bubedorf L, Kallioniemi A, Bärlund M, Schraml P, Leighton S, Torhorst J, Mihatsch M, Sauter G, Kallioniemi O-P. Tissue microarrays for high-throughput molecular profiling of tumour specimens. Nat Med 1998; 4: 844-847.

Kotzerke J, Gschwend JE, Neumaier B. PET for prostate cancer imaging: still a quandary or the ultimate solution? J. Nucl. Med. 2002; 43: 200-2.

La situación del Cancer en España. Varios autores. Ministerio de Sanidad y Consumo. 2005.

Lee JJ, Earle CC, Weeks, JC. Outcomes research in oncology: history, conceptual framework and trends in literature. JNC 2000; 92: 195-204.

Lewison G. "A Bibliometric Approach to the Outputs and Funding of Cancer Research. Ed. European Cancer Research Mangers Forum (ECRM).

www.ecrmforum.org

Life Sciences and Biotechnology. A Strategy for Europe, Bruselas. Commission of the European Communities. (2002).

LiVolsi V, Clausen K, Grizzle W, Newton W, Pretlow TG and Aamodt R. The Cooperative Human Tissue Network - An Update. Cancer 1993; 71; 1391-1394.

Lockhart DJ and Winzeler EA. Genomics, gene expression and DNA arrays, Nature 2000; 405: 827-36.

López-Abente G, Ramis R, Pollán M, Aragonés N, Pérez-Gómez B, Gómez-Barroso D, Carrasco JM, Lope V, García-Pérez J, Boldo E, García-Mendizabal MJ. Atlas municipal de mortalidad por cancer en España 1989-1998. Área de Epidemiología Ambiental y Cancer del Centro Nacional de Epidemiología, ISCIII, año 2007. http://www.isciii.es/htdocs/centros/epidemiologia/libros/Atlas_municipalpdf

Louie AY, Huber MM, Ahrens ET, Rothbacher U, Moats R, Jacobs RE, Fraser SE, Meade TJ. In vivo visualization of gene expression using Magnetic Resonance Imaging. Nature Biotech. 2000; 18: 321-5.

Martin DB and Nelson PS. From genomics to proteomics: techniques and applications in cancer research, Trends Cell Biol 2001; 11: S60-5.

Méndez-Vásquez R, Suñén E, Cervelló R, Camí J. Mapa bibliométrico de España 1996-2004: Biomedicina y Ciencias de la Salud. Med Clin (Barc) 2008; 130: 246-53.

Informe previo publicado y disponible en: http://bibliometria.prbb.org/MapaBiomedico2004 Barcelona: PRBB-ISCIII, 2006.

Ministerio de Politica Social RD 339/2004, de 27 de febrero sobre acreditación de institutos de investigación sanitaria. BOE 63, 13 de Marzo de 2004; 11409-11412.

Ministerio de Politica Social Orden SCO/1245/2006, de 18 de abril, por la que se desarrolla el Real Decreto 339/2004, de 27 de febrero, sobre acreditación de institutos de investigación sanitaria. BOE 101, 28 de Abril de 2006; 16538-16540.

Moreno V, Gonzalez J, Soler M, Bosch F, Kogevinas M, Borràs J. «Estimación de la incidencia de cancer en España. Periodo 1993-1996». Gaceta Sanitaria 2001; 15: 380-8.

Naber SP. Continuing the role of a frozen-tissue bank in molecular pathology. Diag Mol Pathol 1996; 5: 253-259.

Negm RS, Verma M, Srivastava S. The promise of biomarkers in cancer screening and detection. Trends Mol. Med. 2002; 8: 288-293.

Parkin DM, Chen VW, Ferlay J, Galceran J, Storm HH and Whelan SL (eds). Comparability and Quality Control in Cancer Registration. Edited by IARC Technical Report No. 19, Lyon 1994.

Perera FP, Westein IB. Molecular epidemiology: recent advances and future directions. Carcinogenesis 2000; 21: 517-24.

Pito J. Cancer epidemiology in the century and in the next decade. Nature 2001: 411: 390-5. Red de investigación del National Cancer Institute (NCI), EE.UU.

http://cancer.gov

http://www.nci.nih.gov/

http://www.nci.nih.gov/researchprograms

http://cis.nci.nih.gov/Fac/1_2.htm

Pla Director d’Oncologia. 2006. Departament de Salut Generalitat de Catalunya.

Plan Integral de Control del Cancer de la Comunidad de Madrid. Enero 2007.

Plan Nacional de Investigación Científica, Desarrollo e Innovación Tecnológica 2008–2011. Comisión Interministerial de Ciencia y Tecnología. http://www.plannacionalidi.es/plan-idi-public/documentos/plan_nacional_08-11.pdf

Plan Oncológico de Castilla-La Mancha 2007–2010. Estrategias de Prevención y Atención al Cancer. Consejería de Sanidad Junta de Comunidades de Castilla-La Mancha.

Plan Oncológico de Galicia 2002-2005. Consellería de Sanidad. Xunta de Galicia.

Plan Oncológico de la Comunidad Valenciana. ORDEN de 29 de enero de 2004, de la Conselleria de Sanidad, por la que se regula el Plan Oncológico de la Comunidad Valenciana. DOGV - Núm. 4.691 13 de Febrero de 2004. Pag 3419-3421.

Plan Oncológico de la Comunidad Valenciana 2002-2006. Consellería de Sanitat. Generalitat Valenciana.

Plan de salud de la Región de Murcia 2003-2007. VI. Plan de salud. Área de Cancer. Consejería de Sanidad de la Región de Murcia.

Programa Ingenio 2010. http://www.ingenio2010.es/

Redes Temáticas de Investigación Cooperativa en Salud. Instituto de Salud Carlos III, Ministerio de Sanidad y Consumo. ORDEN SCO/806/2006, de 13 de marzo. BOE 68, 11 de mayo de 2006; 11109-11111.

Red Temática de Investigación Cooperativa en Cancer (RTICC), Plan Estratégico de Actuación de la Red. http://www.rticc.org.

Red Temática de Investigación Cooperativa en Cancer (RTICC), Estructura Organizativa de la Red, 2006.

http://www.rticc.org.

Rodés, J. y Trilla A. Clinical research: from bench to bedside (2003), Medicina Clínica (Barcelona), 121: 189-191.

Scherf U, Ross DT, Waltham M, Smith LH, Lee JK, Tanabe L, Kohn KW, Reinhold WC, Myers TG, Andrews DT et al A gene expression database for the molecular pharmacology of cancer, Nat Genet 2000; 24: 236-44.

Seltzer MA, Yap CS, Silverman DH, Meta J, Schiepers C, Phelps ME, Gambhir SS, Rao J, Valk PE, Czernin J. The impact of PET on the management of lung cancer. J. Nucl. Med. 2002; 43: 752-6.

Servicio de Epidemiología del Cancer. Situación del cancer en España (López-Abente G et al., autores). Centro Nacional de Epidemiología. Instituto de Salud Carlos III. Madrid, 2003.

http://www.isciii.es - http://www2.uca.es/hospital/atlas/introdui.html

Sidransky D. Nucleic acid-based methods for the detection of cancer. Science 1997; 278: 1054-9.

Simon R. Design and analysis of clinical trials in «Cancer. Principes and practice of Oncology». 6th Edition- V. de Vita, Lippincott Williams and Wilkins. 2001.

Stark DD and Bradley WG (eds). Magnetic Resonance Imaging, Mosby, St. Louis, vols 1-3. (1999).

The EUROCARE Working Group. European Journal of Cancer 2009, Vol 45 Varios articulos y autores.

http://www.eurocare.it/Publications/tabid/61/Default.aspx

Van Dyke T, Jacks T. Cancer modelling in the modern era: progress and challenges. Cell 2002; 108: 135-144.

Verdecchia A.; Francisci S.; Brenner H.; Gatta G.; Micheli A.; Mangone L. et al Recent cancer survival in Europe: a 2000-02 period analysis of EUROCARE-4 data Lancet Oncology 2007,8:784-796.

Wilking N. and Jönsson B. A pan-European comparison regarding access to cancer drugs. September 2005. Karolinska Institutet.

The update of the Cancer Strategy of the Spanish National health System, approved in 2006, was prepared based on the conclusions of the first evaluation and the review of the scientific evidence available. As in most Western countries, cancer is currently one of the major diseases or groups of diseases in terms of public health in Spain. This Strategy means a chance to optimize the prevention, diagnosis and treatment of cancer, as well as to improve the cancer information and enhance cancer research.

This Cancer Strategy Update incorporates all of the knowledge and data available to date regarding this disease, collaborating toward putting the situation of cancer in Spain up to date. In short, the objective is to aid toward improving the services provide nationwide for those affected by this type of disease based on the principles of quality, equity and cohesion, precisely as set forth under the Quality Plan.

To this end, the document sets out a set of objectives and recommendations aiming to contribute to improving the quality of the interventions and results of the services and of the health care provided.

The end purpose of this information is to serve as support for setting priorities in the health policies in Spain and thus contributing to reducing the burden of cancer on our population, as well as reducing the inequalities existing among the different geographical areas of Spain.

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