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ORIGINAL PAPER

Colorectal cancer in Portugal

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Abstract Increasing diagnosis and deaths caused by colorectal cancer (CRC) warrant closer examination of affected patients and focus on management of CRC in Portugal. In order to assess the extent and quality of the information available in Portugal, we first analyse Portuguese cancer registries and then the management of CRC by discussing the diagnostic process and medical care provided, especially pharmaceuticals. Other cancer indications are mentioned in order to illustrate current approaches of cancer in Portugal. Current national data on cancer patients are scarce and there are divergencies in methods of data collection and treatment amongst regional cancer registries. However, the available data is sufficient enough to understand the dimension of CRC, with age-standardised incidence of 37 per 100,000 and mortality of 31 per 100,000 annually. An ongoing project is restructuring health services to improve efficiency and quality, however, some problems exist. The regional inequity of access to health care facilities and long waiting times for diagnostic examinations and surgery are major examples. Despite the non-availability of clinical guidelines, a pilot screening programme started at the beginning of 2009 in the Centre Region of the country. It is hoped that this overview will provide the basis for discussion on improvements in CRC management in Portugal and lead to better outcomes.

Keywords Colorectal cancer · Portugal · Cancer registries · Access · Screening

JEL Classification I11 · I12 · I18

Introduction

The upward trend in the incidence and mortality of colorectal cancer (CRC) in Europe requires all countries to internally assess conditions faced by these patients. This involves the analysis of different issues, from the appraisal of data registries to the management of patients' diagnosis and treatment. A detailed overview will hopefully motivate the discussion on opportunities for improvement of CRC. The following provides a description to catalyse a discussion, focusing on Portuguese CRC management.

Background and objectives

Colorectal cancer is a growing problem in Portugal, as its mortality rate has been increasing since the 1980s [1]. Although available data are not of high quality, they allow us to understand the dimension of the problem, estimated by the number of sufferers and methods used in diagnosis, treatment and surveillance.

The latest cancer registries show 14.6% of cancer deaths in 2005 were due to CRC (3319 CRC deaths/22,682 all-site cancer deaths) [1]. Total cancer mortality grew 15.8% between 1993 to 2005. Moreover, CRC incidence ranks

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second among all cancers in both men (16.5%) and women (14.6%), after prostate (21.6%) and breast cancer (30.4%), respectively.

From 2000 to 2005, the number of CRC deaths increased at an annual average growth rate of 3%. Although this rate is similar for both sexes, mortality numbers are about 30% higher in men than in women. This proportion is even higher if we look at the 55-to 64-year (57%) and 65- to 74-year (74%) age groups. The available data allow us to analyse the age-specific rate per 100,000 inhabitants in 2000 and 2004 (Fig. 1). The higher impact in men and the increasing mortality as people grow older are clear from the data shown.

The most affected region is Alentejo, where the mortality in 2004 was 43.6 per 100,000 inhabitants. Other regions had lower rates, including Lisboa e Vale do Tejo (36.1/100,000), Centre and Algarve (32/100,000) and the North region (24.2/100,000).

Detailed national incidence data are only available for 1993 and 2001 (Fig. 2). The new CRC annual cases grew by 44% in men (from 2,060 to 2,975) and 28% in women (from 1,722 to 2,205) between these years. Age-specific rates show a higher incidence in men, especially in the 65- to 74-year group, overall 96% were adenocarcinomas (2001) (Fig. 2) [2].

The age-specific distribution of prevalence is similar to the incidence results. In 2005, there were 4,956 men and 3,845 women with CRC in Portugal [2].

The increase in CRC cases in the last 30 years is mainly attributed to environmental factors, especially changes in lifestyle. The decrease in adoption of the traditional Mediterranean diet (especially lower consumption of cereals and olive oil) higher energy intake (animal fats, red meat and alcohol), as well as a more sedentary life are key risk factors. This is consistent with lower incidence of the disease in women as they usually have different dietary habits, with a lower intake of meat and alcohol and a higher consumption of fruit, bread and dairy products. Hormonal differences might also be an additional reason for this difference [3]. Other than that, opportunistic screening may also be responsible for a growing number of CRC diagnoses.

The age-specific survival rates of CRC patients for 2000 and 2001 (the only period for which survival data were available) find as patients grow older, rates decrease (Fig. 3). Women seem to have slightly higher survival rates than men, although not significantly; the figure shows only the total age-specific survival results. The global survival rates are estimated to be 73%, 55% and 46% at 1, 3 and 5 years, respectively [4].

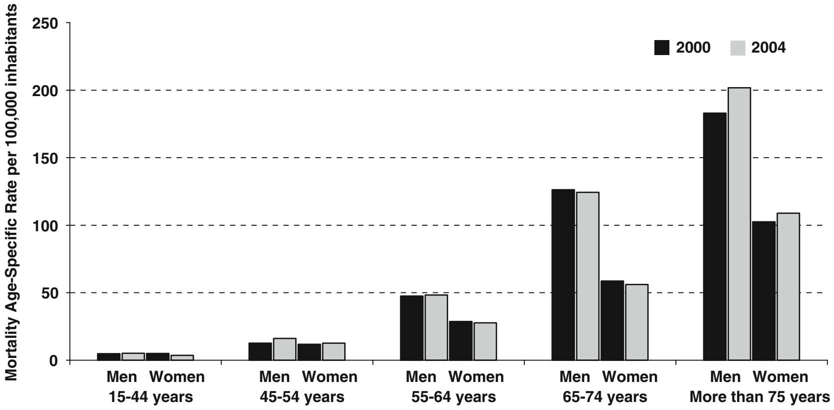

Fig. 1 CRC mortality: age-specific rate per 100,000 inhabitants [19]

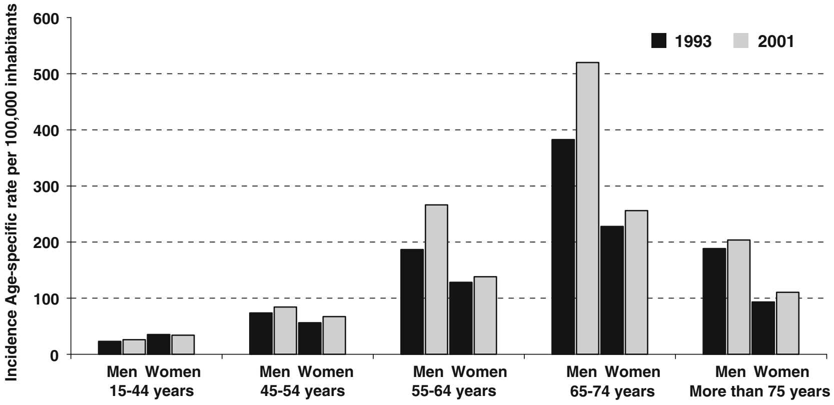

Fig. 2 CRC: age-specific incidence rate per 100,000 inhabitants (National Oncological Registry, 1993 and 2001 [3, 4])

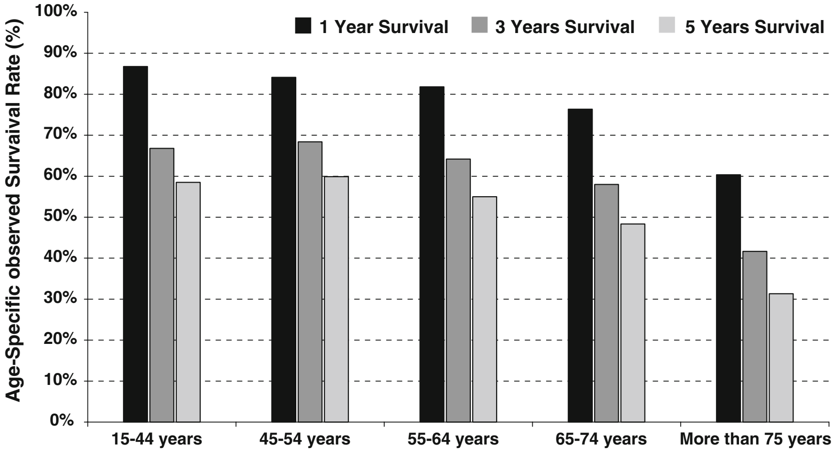

Fig. 3 CRC: age-specific observed survival rate per 100,000 inhabitants (Regional Oncology Registry-South, 2000/2001 [3, 4])

The Direcção Geral da Saúde is the public entity responsible for educational campaigns on food and lifestyle habits. Some patients and volunteer associations supporting cancer patients have also been responsible for continuous prevention campaigns. The European association Europacolon is currently developing a campaign on changing dietary habits in schools—children are the target.

Cancer registries and data sources

The first population-based registries in Portugal were developed in the north—Viana do Castelo began in the 1970s and Vila Nova de Gaia in the 1980s. In 1985, the Viana do Castelo registry was discontinued due to insufficient funding. Ironically, since that year, data from the Vila Nova de Gaia registry has been published in the Cancer Incidence in Five Continents organised by the International Agency for Research on Cancer (IARC).

In the 1980s, several hospitals across the country set up registries, but only in 1988 was the registration of cancer patients legally enforced [5], demanding population-based registries to cover the whole Continental area (main regions are the Continent and the Azores and Madeira islands). Three regional registries were developed covering the Continent and Madeira, where 97.5% of the total Portuguese live (Table 1). The Vila Nova de Gaia registry remains autonomous, but its data are integrated into Regional Oncology Registry North (RORENO).

The centres' main objectives are to assess incidence, prevalence and mortality of all cancers, and to develop epidemiological studies. Survival data are collected, but not, however, considered a primary objective of the cancer registries. Original data are provided by public and private hospitals, primary care services and other health care institutions, and registries are compulsory in all central and district Portuguese hospitals [5]. Clinical and anatomical pathology reports are used for statistical purposes but not death certificates, as these may induce over-registration due to undiagnosed lifetime cancers.

Table 1 Registry centres in Portugal [3]

Name	Country region	Population coverage (million inhabitants)	Initial year
RORENO	North	3.5	1988
ROR-Centro	Centre	1.7	1990
ROR-Sul	South and Madeira	4.5	1989

Table 2 Information collected in Cancer Registries Centres in Portugal [3]

Information on	RORENO	ROR-Centro	ROR-Sul
Stage of disease	Yes	No	Yes
Basis of diagnosis	No	No	Yes
Address	Yes	No	Yes
Follow-up	Partial[a]	No	Partial[a]
Multiple primaries in one patient	Yes	No	Yes

[a] In the more important oncology centres

All the variables are presented by sex and age group. Incidence data are also divided by diagnosis and morphology of the tumour, but information on treatment is not collected. Moreover, mortality is analysed by region and survival results are assessed at 1, 3 and 5 years.

In spite of extensive coverage of the population by the registries (more than 95%), there are significant differences in data collection methodology (Table 2) and public availability. Harmonisation and collaboration between centres was identified in the National Plan for Oncology Diseases Control and Prevention (2007) [6] as an essential strategy to obtain reliable data. However, this objective is far from being achieved, due to variations in the indicators collected.

ROR-Sul has recently increased professionals in hospitals specifically to develop the registries as well as

Table 3 Data available in ROR-Sul database [7]

Availability of	Colon cancer [%]	Rectal cancer [%]
Date of first visit with GP	0	0
Date of first request for clinical appointment	5	17
Date of first hospital appointment	97	97
Date of definitive diagnosis	98	98
Date of first surgery	100	97
Date of first chemotherapy	95	95
Date of first radiotherapy	99	96
At least one pre-diagnostic date	98	97
All pre-diagnostic dates	0	0
Al least one treatment	100	100

improving its on-line database. They also organise annual conferences presenting ROR-Sul epidemiological studies and discussing their registries' issues. However, data access is complicated for researchers outside the health units participating in data collection. In their latest conference (February 2009), some preliminary data on cancer incidence were presented for 2007 but other epidemiological variables referred to 2001. The quality of the 2007 data was internally assessed and the main conclusion was that their validity should be significantly improved, especially in issues like dates, topography and treatments. However, it was found that the completeness of the data had improved by 4%, achieving full completeness after cross-linking the registries with the outcomes from the Diagnosis Related Groups.

In 2008, the European Commission (EC) assessed the availability of cancer data across Europe. In Portugal, only ROR-Sul data production was evaluated (Table 3). Except for the date of the first chemotherapy and radiotherapy treatment, all other variables are routinely collected and easy to find [7].

CRC screening

In 2008, a pilot CRC official screening programme in the Centre region was implemented, led and mainly financed[1] by the regional health directorate. The programme guidelines were based on the Recommendations from the European Commission [8], which state that every man and woman between 50 and 74 years old should undergo guaiac faecal occult blood testing (FOBT)—Hemoccult—biennially until 2012. There are approximately 682,000 people eligible for the screening programme—the target population living in the Centre region of the country [9]—who will be invited by mail. Furthermore, individuals at high familial risk will be asked to address their risks at the hospital.

In 2006, the Portuguese Society for Digestive Endoscopy (SPED) asked private firms to acquire flexible sigmoidoscopies (FS) which were distributed to eight public hospitals throughout the country. The first year evaluation of this screening programme was completed and internally presented to physicians but never made public. This programme allows 10,000 FS examinations in these hospitals until 2010. SPED does not support FOBT pilot screening programme carried out in the Centre region as it believes the guaiac FOBT sensitivity is too low.

Family physicians are increasingly encouraging their patients to undergo CRC screening based on SPED guidelines, recommending earlier and more frequent screening in patients with familial risk. Patients without familial risk older than 50 years are usually recommended to have annual FOBT or, a FS every 5 years or, a full colonoscopy every 10 years. Patients with one direct relative with CRC older than 50 years should have a FS every 5 years starting at 40 years. Those with more than one direct relative with CRC or one relative with CRC under 40 years should undergo colonoscopy every 5 years starting at age 40. Patients with a high family risk, adenomatous polyps or Lynch Syndrome should be referred to a specialized hospital. In such circumstances, when screening examinations are suggested by family physicians (opportunistic screening), the standard user fee is charged at public institutions or an out-of-pocket payment is required at private facilities (see section on access).

A study developed by ForPoint, Europacolon Portugal and the Research Group on Digestive Cancer estimated that 49% of CRC cases were diagnosed by the general practitioner, 31% by a specialist physician and 20% by emergency services. Furthermore, 19% of these cases were diagnosed via routine examination, non-specific for CRC [10].

Other CRC screening programmes were organised by SPED in several hospitals across the country. Here, the patients were not charged for screening and the financial support came from different sources: regional health directorates, private foundations (like the Calouste Gulbenkian Fundation) and volunteers' associations, specially the Portuguese League Against Cancer.

The National Co-ordination for Oncology Diseases (CNDO) and Direcção Geral da Saúde (DGS—General Directorate for Health) are officially in charge of organising CRC prevention activities, but SPED has also an important role in them. Most of the information provided

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[1] Some financial support was also provided by The Office of the High Commission for Health [Alto Comissariado da Saúde], an institution of the Ministry of Health. Some of its main objectives are technical support, follow-up and evaluation of the policies implemented by the Ministry.

by these institutions relates to screening alerts, dietary habits and healthy lifestyles.

Screening programmes for breast and cervical cancer were also implemented in Portugal. The breast cancer screening programme started in 1986, developed by the Portuguese League Against Cancer in co-operation with the regional health directorates. The programme covers the Centre region and some other regions in the North and Alentejo. This volunteer association has recently started a 2-month screening programme in Albufeira (Algarve). Women between 45 and 69 years old are invited to have a mammography every 2 years, following EC recommendations [8]. Examinations are, carried out in mobile units. Suspicious results are referred to clinic and subsequently to hospital for diagnosis and treatment. One million mammographies have already been carried out and 2,000 cancer conditions were detected.

As with CRC, cervical cancer is the object of an official pilot screening programme. However, in some regions, the programme started well before the national one. For example, in the Centre region a structured screening project started in the 1990s. In 2002, the incidence in the Centre region was 9.7 cases per 100,000 women while the national average was only slightly higher: 13.5 cases per 100,000. Monitoring of this programme will start commence in 2009. In the North, only one primary health care centre has an organized programme through which women between 30 and 60 years old are invited to the examination every 5 years. It is planned to extend this system to all other primary health-care centres in the region. From January 2008, 13,500 women were screened in Alentejo. In Lisboa e Vale do Tejo and Algarve the screening programme is starting end 2009 and extending nationally begin 2010.

CRC treatment (non-pharmaceutical)

Universal coverage is assured by the Portuguese National Health Service (NHS), as defined by Law [11]. Firstly, primary health care services are provided through compulsory gatekeeping. The family physician first examines the patient and then, if a specialized treatment or diagnosis is needed, will refer the patient to a specialist. If the patient wants to be directly advised by a specialist, he will have to consult privately. Patients looking for private health-care services pay the full cost, or at least a copayment if they have a private insurance or an occupational public insurance scheme (civil servants, military). According to the NHS 2005/2006 Survey, 80% of respondents claimed to use mainly public health-care services, 17% used their occupational public insurance scheme and 3% used the private system, with the latter two groups preferring the private system.

Access to health care, as guaranteed by the NHS, is almost free. Patients must pay user fees when using hospital or primary care services, but some population groups (around 45%) are exempt, namely pensioners earning less than the minimum wage, cancer patients, pregnant women or diabetics. Medicines prescribed in ambulatory units are reimbursed by the Government at different rates, depending on the disease the drug treats and the disease severity. Pharmaceuticals provided in hospitals are fully paid by the Government.

Financing of public hospitals is based on contracts signed by the Ministry of Health and each health care unit, which defines its budget constraint. This may be adjusted when the health care production is different from the initial forecast. These adjustments are also defined by law [12]. Health-care services are valued nationally by Diagnosis Related Groups.

Total expenditure on health has risen sharply in the past years, amounting to € 14,633 million in 2006 with 70.9% financed by the Government. In 2001, these values were, respectively, € 11,466 million and 57.4%. In contrast, expenditure per capita amounted to only € 2,120 in 2006 and € 1,613 in 2001.

The organisation of health-care delivery is similar, irrespective of the disease. However, some special conditions, including cancer, are referred to specialized hospitals, where adequate human resources, facilities and treatments are completely available. For cancer, after diagnosis, the patient will most likely be referred for surgery or oncology treatment to a specialized hospital. There are, however, some difficulties and consequent delays in patient referrals. How the NHS handles cancer patients nowadays and the perspectives for the future are the focus of the next subsections.

Facilities

In 1999–2000, the National Oncology Council surveyed all public hospitals on existing oncology services—location, personnel, organisation and resources—using 1997 as the reference year. Results were published in the Hospital Reference Network in Oncology [13]. This document suggested the re-organization of oncology services through the creation of a network, in which health-care institutions would work complementarily [13]. The report concluded that oncology services were being provided in hospitals without real oncology units or services and that existing units were set up without prior planning. Treatment and diagnosis resources were scarce and did not work complementarily. Situations were handled independently of annual patient numbers admitted and diagnosis and treatment procedures were not harmonised within or among institutions. Each institution did not know its own reality—quality was not internally assessed or compared with other institutions. Moreover, it concluded there was inequity in the provision of oncological services.

The equipment available in public hospitals in November 2001 was also described in the same document. There were 34 hospitals with axial tomography, but only three of these were located in the South region. The others were evenly distributed through the rest of the country (11 North, 9 Centre, 11 Lisboa e Vale do Tejo regions). Magnetic resonance, radiotherapy and nuclear medicine units were available in just 9 hospitals, located in the North, Centre and Lisboa e Vale do Tejo regions. The South region had none of these services at the time of analysis. Positron emission tomography was being installed in two Portuguese hospitals at that time—Coimbra (Centre region) and Lisboa.

Although not very recent, the data show that available resources and the organisation of services are inadequate. Moreover, on-going education and training of health care professionals are underfinanced [13]. In the SPED's opinion, human resources available in Portugal are satisfactory but not adequately distributed as there are too many health care professionals in urban areas.

Although some initiatives to change this situation are occasionally implemented in each hospital—and not organized nationally—there is no evidence of clear improvements on these issues. The re-organization suggested by the Hospital Reference Network in Oncology and discussed below [13] is still ongoing.

The report suggested that the Network should integrate different types of institutions. Primary health care units, hospitals, oncology institutes and private providers working for the NHS on a fee-for-service basis should all be included. The structure of the network would be based on three types of platforms—A, B and C—each one including oncology services combining the level of proximity to the patients with the level of differentiation of services provided. Each platform would require some organic and functional prerequisites as well as a predefined amount of resources and facilities.

Platforms C correspond to hospitals located in peripheral areas. Technically, a platform C should exist for each 300,000 inhabitants. These institutions should be prepared for diagnosis and treatment of the most common types of cancer, with an incidence equal to or higher than ten cases per year for each 100,000 inhabitants. CRC cases would be handled in these platforms, as well as skin (except melanoma), breast, prostate, stomach, lung, bladder and uterus cancers. The human resources available should be specialised in surgery, urology, gynaecology, pulmonology, gastro-enterology, dermatology, imaging, morphological and clinical pathology, clinical haematology, immunohaemotheraphy, neurology, psychiatry and psychology. Access to radiotherapy should also be assured. To guarantee the quality of the health care provided, some functional and organisational issues would be addressed. The co-operation between specialised physicians should be common practice: multidisciplinary visits for therapeutic decisions, an Oncology Coordination Commission and guidelines for diagnosis and treatment. The platforms should assure management of their patients' registries and clinical research and ongoing education encouraged.

Platforms B are mainly located at central hospitals and at some regional centres of the Portuguese Oncology Institute. They would provide the same services as platforms C and be responsible for the diagnosis and treatment of types of cancer with incidence equal to or higher than 2.5 cases per year per 100,000 inhabitants. Twelve types of cancer would be added to their responsibility: oesophagus, lymph nodes, lips, larynx, melanoma, ovary, pancreas, kidney, haematopoietic system, central nervous system and thyroid. Note that if the technical requirements for the treatment of a rectum cancer case (for example) were too specific, its treatment would be handled in platforms B and not C. Besides the resources required in platforms C, platforms B would include clinical haematologists and the hospitals with intensive chemotherapy units with haematopoietic support would follow the appropriate legal principles in transplantations.

Finally, platforms A would be based on the regional centres of the Portuguese Oncology Institute and prepared to deal with diagnosis and treatment of every type of cancer, independent of its incidence, and particularly those requiring the use of complex or less common techniques or technologies. Also, platforms A must give technical assistance to platforms B and C. Furthermore, central platforms should take more responsibilities in clinical research, namely clinical trials and development and evaluation of new technologies. They would also assure ongoing education, discussion and elaboration of clinical guidelines, co-ordination of screening actions and management of oncology registries.

Access

Public sector care is provided free of charge to all cancer patients [14]. Unless qualifying for select patient groups, nominal non-reimbursable user fees must be paid [15]. There are different user fees for each health care service provided: emergency service at a central hospital € 9.40, FOBT CRC screening is free but charged € 2.20 for the GP visit, € 2.70 for FS or € 6.90 for colonoscopy. Any patient opting out of private health-care service will have to pay

Table 4 Regional distribution of platforms suggested in the Network of Hospital Reference in Oncology [13]

Region	Platforms		
	C	*B*	*A*
North	11	4	1 or 2
Centre	7	2	1 or 2
Lisboa e Vale do Tejo	11	4 or 5	1 or 2
South	2	0	0

the full price of examination or, at least, a copayment if he benefitting from some form of supplementary insurance.

However, patients may have to pay additional substantial amounts for care, due to regional inequities in the distribution of specialised personnel and resources, especially for diagnostic examination and treatment. In 2005, the National Coordination for Oncology Diseases surveyed regional health directorates on the execution of the National Oncology Plan 2001–2005 and on hospitals' oncology service availability and human resources, finding disparities among institutions and regions. The regional distribution of platforms suggested in the Hospital Network Reference in Oncology was conceived in such a way as to minimise inequity in the access to these services (Table 4). Note that platforms A are also considered as platforms B or C, and platforms B are also considered as platforms C, as they are substitutes. Apparently, these recommendations have not yet been followed.

The average waiting time for CRC patients is 1.5 months from referral to diagnosis by endoscopy, 2–3 months until a specialist visit at the hospital and 2 months for a staging examination [1].

In 2007, 35,698 cancer surgeries were carried out in Portuguese hospitals. The most common surgeries were skin (19%), breast (14%), CRC (13%), bladder (10%) and uterus cancer (6%) [16].

In order to decrease surgical waiting times, the Portuguese Government created in 2004 the Integrated Management System of Patients Signed Up for Surgery (SIGIC). This system aims to assure all patients signed up for surgery in public hospitals are transferred to another hospital (public, private-not-for-profit or private-for-profit) if the forecast waiting time for surgery exceeds 9 months in non-priority situations or 4 months otherwise. When this is impossible, the intervention must be scheduled to be performed in 12 months time, maximum. If this deadline is not met, the hospital may suffer a penalty. The Central Unit of Patients Signed for Surgery Management (UCGIC) is responsible for the supervision of the process and for communication with patients.

In 2008, maximum times were legally set in which every health care unit must provide each service [17] (Table 5).

Table 5 Legally guaranteed maximum waiting time [17]

Priority level	Reference from primary care to an oncology platform	Time until first specialized hospital visit in an oncology platform	Time from surgical indication to surgery
4	Immediately	NA (emergency service)	72 h
3	24 h	7 days	15 days
2	24 h	15 days	45 days
1	24 h	30 days	60 days

NA not applicable

The maximum waiting time stipulated for oncology services depends on the clinical situation of the patient. Four priority levels were defined:

- Level 4: Cancer patients with a high risk of dying
- Level 3: Aggressive neoplasms in fast progression with no immediate risk of death
- Level 2: Neoplasms not included in levels 3 and 4
- Level 1: Indolent neoplasms

In May 2008, there were 3,855 cancer patients waiting for surgery. Half of the cancer patients who underwent surgery in 2007 waited less than 18 days, the average waiting time was around 1 month. However, depending on the priority level, each patient could have waited between 3 days and 4 months [17].

One of the main objectives of the National Plan for Oncology Diseases Control and Prevention 2007/2010 [6] is the development of an Integrated Network of Reference in Oncology, mentioned above. This network will improve the communication among these units and the access to them. Furthermore, the creation of multidisciplinary teams for pathology groups will be promoted. This network is currently under study, and will be concluded by the end of 2009 in order to implement the network in 2010.

The same document states that all radiotherapy units should be modernised and equipment replaced by 2010 if they are more than 10 years old. Also, the National Programme of Palliative Health Care is under development and should be included in the Integrated Network of Referencing in Oncology.

Clinical guidelines

Although national CRC treatment guidelines have already been developed, they were not made available to anybody outside the group of people directly involved. At present, physicians usually follow the SPED recommendations, which are based mostly on the two existing American guidelines and are annually adapted to take into account

Portuguese clinical practice. However, these are not considered formal guidelines, so different physicians may choose to follow guidelines from different countries, which is against the harmonisation of the procedures.

Pharmaceutical treatment

INFARMED is the national regulatory agency responsible for guaranteeing the quality and safety of pharmaceuticals in Portugal. In order to obtain the marketing authorisation for a new pharmaceutical, the laboratory must provide information on its efficacy, quality and safety. Furthermore, INFARMED is responsible for advising the government on reimbursement of new pharmaceuticals by the NHS. According to law, reimbursement decisions of a new pharmaceutical are based on economic assessment as well as clinical and pharmacological properties. This is the case for all new medicines used in hospitals and for most purchased in outpatient facilities, especially if the patent owner asks for a premium price and/or the target population is large. In these cases, INFARMED demands the patent owner submit an economic evaluation study and an estimate of the impact of the reimbursement of the drug on the NHS budget.[2]

All pharmaceutical treatments provided in public hospitals are totally reimbursed by the NHS. As most cancer treatments are supplied in hospital and/or are quite expensive, new pharmaceuticals must have their cost-effectiveness assessed. Although cost-effectiveness is the most commonly used technique, cost-minimization and cost-utility studies are also accepted, depending on the case studied. There are official guidelines for the development of these studies [18].

As a study developed by ForPoint, Europacolon Portugal and the Research Group on Digestive Cancer [10] points out, 71% of CRC patients underwent chemotherapy. The chemotherapy regimen most commonly prescribed at public hospitals depends on disease stage. In Stage I, chemotherapy is not used, but in Stage II 5-FU combined with Oxaliplatin (FOLFOX) is usually used as first-line treatment. In Stages III/IV, 5-FU/FA may be used as first line and FOLFOX as second line treatment. However, in Stage IV other regimens are also used, like 5-FU in combination with Irinotecan or Oxaliplatin in combination with Capecitabine, for both first- or second-line treatment; Bevacizumab in first line treatment; and Cetuximab combined with Irinotecan in second line treatment. All these treatments are administrated intravenously.

In spite of being approved for reimbursement by both the INFARMED and the Ministry of Health, hospital managers may decide whether to make these treatments available or not, depending on the budget. However, the disparities in access between regions are generally due to the availability of facilities, not treatments.

Post-treatment surveillance

Apart from the concern of physicians and hospital services to comply with the best practice available (although judgements on the issue are variable) and follow the patients regularly through routine visits, there are no formal guidelines on post-treatment surveillance.

Final remarks

Although the national data available on cancer patients in Portugal do not allow for a very detailed analysis of CRC patients' condition and evolution, it is possible to briefly outline the main issues discussed. Considering diagnosis as the first approach to the disease, a pilot CRC screening programme has recently started in the central region of the country. Additional CRC screening campaigns, and other cancer diseases, are led mainly by patients' and specialists' associations along with best standard clinical practice where physicians advise higher risk patients to undergo opportunistic screening. Concerning management of the diagnosis and treatment of these patients, the major problems seems to be regional disparities in access to health care facilities, long waiting times for diagnostic examinations and for surgery as well as the non-availability of clinical guidelines. However, the Network of Hospital References in Oncology aims to restructure the health care services in order to use resources more efficiently and to provide a higher-quality treatment for cancer patients. Finally, public hospitals have access to a high range of new pharmaceutical CRC treatments, after their cost-effectiveness value has been proven.

Conflict of interest statement The authors do not report any conflict of interest associated with this paper.

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