

Trends and Patterns of Health Related Internet Use in Portugal

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Abstract: The aim of this paper is to unfold and discuss trends and patterns of health related Internet use in Portugal. It is based on results coming from two surveys to representative samples of the Portuguese population, conducted in 2005 and 2007. Conclusions are of interest to policy makers and several players in the health and telecommunications sectors.

Keywords: eHealth, Internet, trends, citizens, patients, physicians, Portugal, survey

1. Introduction

The use of the Internet for health related purposes is increasing worldwide¹⁻⁴. On the other hand, the Internet is assuming more rich and complex characteristics and functions, progressing from a mere unidirectional information media and imposing itself as a quality, multifaceted, very efficient, extremely reach, and cost effective channel for communicating and commercializing goods and services in the health sphere.

The clinical encounter constitutes undoubtedly the ideal place and opportunity to inform the patient^{5(pp1)} and the physician is still considered by citizens the most important source of health information¹. However, the increasing relevance of the Internet is undeniable, and so is its potential to change patient-doctor relationship⁶. The control over the production and dissemination of health information is not exclusive to medical professionals and researchers anymore and citizens have now access to electronic versions of medical journals and other online sources of health related information⁷. Citizens have become co-producers of health information that is spread through email and virtual communities⁸. They use the Internet to access and manage their own personal health records^{9, 10}. Communicating online seeking advice from unknown doctors^{11, 12}, and ordering medicines are other opportunities to become informed. Many state that the medical information and guidance they can find online is more complete and useful than the information that is typically provided by their physicians¹³.

This work is part of the project WHO/European eHealth Consumer Trends Survey, supported by the World Health Organization and co-funded by the European Commission. The project last from June 2005 to June 2008. The first phase of the study that took place in 2005 allowed to build the profile of the European using the Internet for health related matters¹. The research has shown that a significant percentage of the citizens of all the seven participant countries have already used the Internet for health or illness related purposes but significant regional differences were also signaled. In Portugal¹⁴, the data have shown that 30% of the Portuguese have already used the Internet to get health related information, placing the country in fifth place in the ranking of the seven investigated countries, behind Denmark (62%), Norway (59%), Germany (49%) and Poland (42%)¹. Of the 30% of users, 14% have resorted to this media at least once a month, an increase of 8.2% relatively to 2003¹⁵. In the sub-group of Internet users, the percentage of Portuguese that have already used it to find health information was quite higher, reaching 62%.

The survey was repeated in 2007, in order to detect trends and patterns in the level and frequency of use, as well as in citizens' opinions, attitudes and expectations towards the Internet and online health services. This paper reports and discusses part of the results achieved in the three years of the project.

2. Objectives

Unfold and discuss trends and patterns of health related Internet use in Portugal. We aim at creating actionable knowledge for several players in the health sector but also for other stakeholders like policy makers and technology developers.

3. Methodology

The results here reported are part of the European project "WHO/ European Survey on eHealth Consumer Trends", supported by the World Health Organization and co-funded by the European Commission, program of Community action in the field of Public Health (2003-2008) of the Health & Consumer Protection Directorate-General, Directorate C¹.

Researchers from Denmark, Germany, Greece, Latvia, Norway, Poland and Portugal designed a questionnaire in English to be applied in two waves, once in the fall of 2005 and again in the spring of 2007. The instrument was piloted on 100 individuals in Norway, to ensure internal validity and wording comprehensibility. Afterwards, it was translated to the language or languages of the participating countries using a dual focus method¹⁶ that aims at conceptual equivalence, besides dealing with grammar and wording aspects. Within the translation procedure, focus groups were used to refine and evaluate the final national instruments. Data was collected through computer-assisted telephone interviews.

For the first survey, that took place in October and November 2005, a limit of 2000 complete interviews was settled for Portugal, as the number of Internet health users was expected to be low. Considering the knowledge acquired in this first wave, a limit of 1000 completely filled inquiries was established for the second survey carried out in April and May 2007.

The interviewees, individuals between 15 and 80 years old living in households with fixed telephone lines, were randomly selected from a sample specifically generated for the study in each year. Quotas were introduced in order to assure a final stratified sample representative of the Portuguese population, without *à posteriori* data weighting.

Audits made to the data attest the good representativeness of the final samples, according to estimates based on the Portuguese Census and data provided by the Ministry of Education¹⁷. Nevertheless, and for comparison matters, the 2005 data were weighted based on the 2007 data, in order to account for minimum differences in some age levels.

4. Technology Description

We conceive technology as more than artefact, technique or process. Technology may be defined as organized knowledge for practical purposes¹⁸ or as the know-how and the creative process that may utilize tools, resources and systems to solve problems, to enhance control over the natural and man-made environment in an endeavor to improve the human condition¹⁹. Until recently, the knowledge available on the way Portuguese citizens were using the Internet for health related purposes was scanty and nothing has been reported on there perceptions, attitudes or expectations regarding the Internet as a health resource. The first phase of the "WHO/ European Survey on eHealth Consumer Trends" project clearly improved the situation^{14, 20}. Further developments settled the foundations for a continuous monitoring of health related Internet use in Portugal and enable us disguising trends and patterns regarding important aspects of technology adoption and use.

5. Results

Results show that the percentage of the Portuguese population reporting having used the Internet for health or illness matters has increased in average 9.1% (IC 95%, 5.5-12.6) in the 18 months that mediate the two surveys. The analysis by geographical region shows that there are no statistically significant differences between the five studied regions.

The analysis by gender and age shows that the difference between men and women is diminishing but detects important exceptions, namely, a sharp predominance of women in the group of individuals aged 15-34 years old that use the Internet for health or illness matters and the prevalence of men in the age groups 45-54 and 65-80 years old. In the age group 25-34 years old, 39% of Portuguese women have used the Internet for health related matters at least once a year in 2005, percentage that has increased to 63.6% in 2007. In this year, there were 25% more women than men in this age group using the Internet with that purpose. In the age groups 45-54 and 65-80 years, the differences between men and women have increased favoring men, from 8.7% to 13.7% and from 2.4% to 4.5%, respectively.

Information on lifestyle, nutrition and diet has taken to the Internet in the six months prior to the 2007 survey most of all women aged 15-24 years old (54.3%), but has also captivated a significant number of women in the age groups 45-54 (42.4%) and 55-64 years old (41.7%). Information on pregnancy and children care has taken to the Internet 42.1% of women aged 25-34 years old and 24.4% of women aged 35-44 years old. Information on the management of illness related aspects, like sick leave, insurances and rights in the disease was sought by 34.2% of women aged 25-34 years old and 33.3% of those in the age group 45-54 years old, while information on a specific disease was particularly sought among women aged 35-44 years old (56.1%), although registering percentages higher than 40% in all age groups, except among those aged 65 years old or older.

Regarding man, information on lifestyle, nutrition and diet was of interest, particularly, to individuals in the age groups 15-24 (39.1%) and 25-34 years old (39.3%), with percentages decreasing strongly as age increases. In what it respects to information on pregnancy and children care, the highest use was registered among individuals aged 35-44 years old (13.9%). Information on the management of illness related aspects was sought by 33.3% of men aged 35-44 years old, being of significantly less interest to the rest of the male population. Information on a specific disease was sought by 40.6% and 28.6% of the individuals aged 15-24 and 25-34 years old, respectively, but of little interest to the others.

Table 1: Internet Use in Portugal by Age Group in 2005 and 2007, in General and For Health Related Purposes

Age	Internet use	2005			2007						
		N	Men % (CI)	Women % (CI)	Diferential % (IC)	N	Men % (CI)	Women % (CI)	Diferential % (CI)		
15-24	Use the Internet at least once a month	235	87.2 (82.9-91.5)	114	84.1 (77.3-90.9)	3.1 (-4.6-10.9)	112	85.8 (79.3-92.4)	54	85.5 (75.8-95.1)	.4 (-11.2-11.9)
	Use the Internet for health matters at least once a year	235	48.7 (42.3-55.1)	114	57.1 (47.9-66.3)	-8.3 (-19.5-2.9)	112	49.6 (40.2-58.9)	54	67.3 (54.5-80.1)	-17.7 (-33.7- -1.7)
25-34	Use the Internet at least once a month	238	79.8 (74.7-84.9)	112	59.5 (50.2-68.7)	20.3 (10.6-30.1)	125	65.1 (56.6-73.5)	54	74.6 (62.7-86.4)	-9.5 (-24.4-5.4)
	Use the Internet for health matters at least once a year	238	44.5 (38.2-50.9)	112	38.7 (29.5-47.8)	5.7 (-5.3-17.0)	125	38.9 (30.3-47.5)	54	63.6 (50.5-76.8)	-24.7 (-40.3- -9.2)
35-44	Use the Internet at least once a month	151	63.9 (56.2-71.7)	193	39.1 (32.2-46.1)	24.8 (14.5-35.1)	73	64.9 (53.7-76.0)	97	50.0 (39.9-60.1)	14.9 (-0.1-29.9)
	Use the Internet for health matters at least once a year	151	36.6 (28.9-44.4)	193	26.7 (20.5-33.0)	9.9 (0.0-19.7)	73	39.2 (27.8-50.6)	97	36.7 (27.0-46.5)	2.5 (-12.4-17.3)
45-54	Use the Internet at least once a month	111	43.5 (34.2-52.8)	199	26.1 (20.0-32.3)	17.4 (6.6-28.1)	52	56.6 (42.8-70.4)	100	36.6 (27.1-46.2)	20.0 (3.3-36.6)
	Use the Internet for health matters at least once a year	111	23.3 (15.3-31.2)	199	14.6 (9.6-19.5)	8.7 (-1.1-17.5)	52	43.4 (29.6-57.2)	100	29.7 (20.6-38.8)	13.7 (-2.2-29.6)
55-64	Use the Internet at least once a month	75	25.9 (15.8-35.9)	183	6.0 (2.6-9.5)	19.8 (11.5- 28.2)	40	31.7 (16.8-46.6)	87	19.3 (10.9-27.7)	12.4 (-3.4-28.2)
	Use the Internet for health matters at least once a year	75	15.4 (7.1-23.6)	183	4.7 (1.6-7.7)	10.7 (3.6-17.8)	40	22.0 (8.7-35.2)	87	11.4 (4.6-18.1)	10.6 (-2.6-23.8)
65-80	Use the Internet at least once a month	140	7.0 (2.7-11.2)	238	.5 (-4-1.5)	6.4 (3.0-9.9)	70	16.9 (8.0-25.8)	124	3.2 (1-6.3)	13.7 (5.9-21.5)
	Use the Internet for health matters at least once a year	140	3.5 (4-6.6)	238	1.1 (-2-2.4)	2.4 (-5-5.3)	70	8.5 (1.8-15.1)	124	4.0 (5-7.5)	4.5 (-2.3-11.2)
Total	Use the Internet at least once a month	956	59.8 (56.7-62.9)	1045	29.1 (26.3-31.8)	30.8 (26.6-34.9)	478	59.0 (54.6-63.4)	478	37.4 (33.2-41.5)	21.6 (15.6-27.7)
	Use the Internet for health matters at least once a year	956	33.5 (30.5-36.4)	1045	19.2 (16.8-21.6)	14.2 (10.4-18.0)	522	36.0 (31.7-40.3)	522	29.3 (25.4-33.2)	6.7 (9-12.5)

The analysis by level of education completed show that the use is particularly high among those with complete higher education studies, with an increase of 8.2% (IC 95%, - .6-17.0) in the period under analysis. However, a significant increase has been observed among the Portuguese with before A-level studies, particularly when considering the group of Internet users for health purposes, where it has raised from four users in each ten individuals in 2005 to six users in each ten individuals in 2007.

Table 2: Internet Use in Portugal by Level of Education in 2005 & 2007, in General and for Health Related Purposes

	Before A-level studies			Secondary level studies completed			Complete higher education studies								
	2005		Diferential % (CI)	2005		Diferential % (CI)	2005		Diferential % (CI)						
	N	% (CI)		N	% (CI)		N	% (CI)							
Portugueses that use the Internet at least once a month	1280	20.1 (17.9-22.3)	587	25.0 (21.5-28.6)	4.9 (9-9.0)	373	83.9 (80.1-87.6)	221	75.6 (69.9-81.3)	-8.3 (-14.8 - -17.4)	347	87.7 (84.3-91.2)	189	85.7 (80.7-90.8)	-2.0 (-8.1-4.1)
Portugueses that use the Internet for health or illness matters at least once a month	1280	11.4 (9.7-13.1)	587	16.4 (13.4-19.4)	5.0 (1.7-8.2)	373	51.3 (46.2-56.4)	221	51.1 (44.5-57.8)	-1 (-8.5-8.2)	347	52.7 (47.4-57.9)	189	60.9 (53.8-67.9)	8.2 (-6-17.0)
Internet users that use it for health or illness matters at least once a year	332	43.9 (38.5-49.2)	170	56.5 (48.9-64.0)	12.6 (3.4-21.8)	331	57.8 (52.4-63.1)	185	61.1 (54.0-68.2)	3.3 (-5.6-12.2)	317	57.7 (52.2-63.2)	167	68.9 (61.8-76.0)	11.2 (2.1-20.3)

Reading health Web sites is the health related activity that more Portuguese attracts to the Internet but in the restricted group of Internet health users “interacting with a health professional never met face to face” is the activity with higher positive variation in the period (9.2%, IC 95%, 5.3-13.2).

Table 3: Online Health Information Services Use in Portugal in 2005 & 2007, in General and for Health Related Purposes

	Portuguese population					Group of those using the Internet for health related matters				
	2005		Diferential Mean % (CI)	2007		2005		Diferential Mean % (CI)	2007	
	N	Mean % (CI)		N	Mean % (CI)	N	Mean % (CI)		N	Mean % (CI)
Interact with health professionals never met face to face	2001	2.2 (1.5-2.8)	1000	6.3 (4.8-7.8)	4.1 (2.7-5.5)	604	7.2 (5.2-9.3)	383	16.5 (12.7-20.2)	9.2 (5.3-13.2)
Participate in forums or self help groups (focusing on health or illness)	2001	2.6 (1.9-3.3)	1000	5.4 (4.0-6.8)	2.8 (1.4-4.2)	604	8.6 (6.3-10.8)	383	14.1 (10.6-17.6)	5.5 (1.6-9.5)
Order medicines or other products related to health or illness management online	2001	1.6 (1.1-2.2)	1000	3.0 (1.9-4.1)	1.4 (3-2.5)	604	5.3 (3.5-7.1)	383	7.8 (5.1-10.5)	2.5 (-6-5.6)
Read about health and illness in health websites	2001	25.5 (23.6-27.4)	1000	30.3 (27.5-33.2)	4.8 (1.4-8.2)	604	84.5 (81.6-87.4)	383	79.1 (75.0-83.2)	-5.3 (-10.3 - -5)

Health professionals are considered as the most important source of health information but their perceived importance has decreased 10% (IC 95%, -12.6, -7.6) between 2005 and 2007, the higher negative variation in this period. Family, friends and colleagues have registered the higher positive variation. In 2007, the Internet was rated as the most important source of health information by those using it for health or illness purposes.

Table 4: Perceived Importance of Several Health Information Sources in 2005 and 2007.

Source of health information	Portuguese population				Group of those using the Internet for health related matters			
	2005 (N=2001) Mean % (CI)	2007 (N=1000) Mean % (CI)	Diferential Mean % (C)	Rank in 2007	2005 (N=585) Mean % (CI)	2007 (N=383) Mean % (CI)	Variacão Mean % (CI)	Rank in 2007
	Internet	51.5 (49.3-53.7)	55.9 (52.8-59.0)	4.4 (7-8.2)	7 ^o	78.9 (75.6-82.3)	83.3 (79.5-87.0)	4.4 (-7-9.4)
TelevisionTRadio	65.1 (63.0-67.2)	68.8 (65.9-71.7)	3.7 (1-7.3)	4 ^o	60.1 (56.1-64.1)	65.0 (60.2-69.8)	4.9 (-1.4-11.2)	5 ^o
Books, medical encyclopaedias and leaflets	56.7 (54.5-58.9)	58.3 (55.2-61.4)	1.6 (-2.1-5.4)	5 ^o	70.8 (67.1-74.5)	65.0 (60.2-69.8)	-5.8 (-11.8-2)	5 ^o
Courses and lectures	42.9 (40.7-45.1)	45.0 (41.9-48.1)	2.1 (-1.7-5.9)	8 ^o	54.6 (50.5-58.6)	52.2 (47.2-57.2)	-2.4 (-8.8-4.1)	8 ^o
Newspapers and magazines	52.4 (50.2-54.6)	56.5 (53.4-59.6)	4.1 (3-7.9)	6 ^o	55.6 (51.6-59.7)	57.2 (52.2-62.2)	1.6 (-4.8-8.0)	7 ^o
Family, friends and colleagues	72.7 (70.7-74.7)	80.0 (77.5-82.5)	7.3 (4.0-10.6)	2 ^o	63.7 (59.8-67.6)	75.7 (71.4-80.0)	12.1 (6.1-18.0)	3 ^o
Pharmacies	76.5 (74.6-78.3)	73.3 (70.6-76.1)	-3.2 (-6.4-1)	3 ^o	69.7 (65.9-73.4)	69.5 (64.8-74.1)	-2 (-6.2-5.7)	4 ^o
Direct face-to-face contact with health professionals	90.7 (89.4-91.9)	80.6 (78.1-83.1)	-10.1 (-12.6- -7.6)	1 ^o	87.3 (84.6-90.1)	78.1 (73.9-82.2)	-9.3 (-14.0- -4.5)	2 ^o

6. Discussion

The use of the Internet for health or illness matters is increasing in Portugal. Results in the first two years of the project allow us to affirm that the rate of growth more than doubles the rate of growth of Internet use in Portugal. Small regional differences were detected regarding the use of the Internet, in general and for reasons of health or illness, but they are not statistically significant. It is interesting that Alentejo, a scarcely populated traditionally rural region, ranks second place in number of citizens using the Internet for health matters.

Previous studies show that underserved and vulnerable populations, who are at high risk of poor health outcomes from serious health problems, are frequently elderly, of low socioeconomic status, members of marginalized and minority groups or have low levels of education. They often have limited access to relevant health information, especially information widely available online and low levels of health literacy²¹. Globally, the information relating age and level of education with access to online health information in Portugal confirms the results of these studies. In 2005, age and level of education were clearly dividing those resorting to the Internet for health information from those that have never done so. However, if younger and more educated citizens stood out of the rest of the population in this respect, behaviors tended to even out among Internet users. Moreover, results suggested a possible future increment in the use of the Internet for health or illness matters among Portuguese women.

The results from the 2007 survey show a large growth in the number of women using the Internet for health purposes, particularly expressive in the age group 25-34 years old. Among men, the use has either maintained or decreased, especially among individuals aged 15-44 years old, with the largest positive variation in the age group 45-54 years old. Globally, we can affirm that, in Portugal, the increase in the use of the Internet, in general and for reasons of health or illness in particular, is happening via the growing number of women that are using this technology. Controlling for the type of information being seek brings interesting conclusions, especially in the case of women. Apparently, Portuguese women are recognizing in the Internet the potential to preempt their needs for health information in specific moments of their lives and are using the media in a coherent way and more than men to get information on nutrition, diet and life style, pregnancy and children care, specific illnesses and several aspects related to the management of illness. Considering the increasing number of Portuguese women with access to the Internet and to higher education studies, and knowing that level of education is positively related to looking for online health information, this certainly is an issue deserving further investigation and concrete interventions from health professionals and policy makers. Concretely, policy makers should evaluate what it seems a great opportunity represented by the Internet to provide information on nutrition and dietary issues to young women that so interested seem to be in these particular aspects. Specifically designed interventions must be developed, taking in consideration the characteristics, interests and expectations of this population group. The same can be said regarding online information on pregnancy and children care that so much attention is catching from women aged 25-44 years old. We defend that these efforts must be thought as part of a health information strategy for Portugal that must consider the contributions and the interests of several stakeholders, namely, the citizen, the State, health organizations and professionals, all kind of health related associations and companies playing in directly or indirectly related sectors.

Among Portuguese, level of education in 2007 continues to be a decisive factor regarding Internet use for reasons of health or illness. Results also show that, among Internet users, it is individuals with less than A-level studies that the use of the Internet for health matters has increased the most. This suggests a potential for equitable access to health information and services but conclusions have to be interpreted and managed with

caution. Serious developments may arise during the medical consultation, with implications on its duration and the effort required from the doctor to deal with preconceived ideas and expectations generated from online health information. Research confirms that there is a real problem with health literacy which limits the extent to which citizens are able to become more informed about their health, whatever media used²². Therefore, actions are required to overcome the digital divide and promote health literacy^{23, 24} and it is fundamental to assist the public in developing information searching and appraisal skills²⁵.

Reading health Web sites is the health related activity that more Portuguese attracts to the Internet. However, modest increases have been observed between 2005 and 2007 in the number of Portuguese that have done it at least once a year and a small decrease has even been detected among Internet users. From the four ways of getting online health information, “interacting with a health professional never met face-to-face” was the one that have registered the most interesting positive variation. An increase in the number of citizens participating in health forums and ordering medicines and other health related products over the Internet was also noticed. Globally, these results may suggest that more experienced Internet users tend to engage in tasks of growing complexity at several levels, demanding more knowledge, more autonomy and more pro-activity. On the other hand, they may also signalize the emergency of services that were unavailable, or at least not easily accessible in Portuguese, in 2005. Language certainly is an enormous barrier when access to the huge amount of contents, forums, “ask the doctor” services and pharmacies available in WWW is at stake. Most of these services are run in English, a language that a significant part of the Portuguese population does not dominate or does not dominate at a level that allows them participating in linguistically demanding tasks. However, an increase in such activities is predictable in a close future. The demand for services run in Portuguese will certainly come from older people, but a growing demand for services in English is expected from the youngest generations that have higher levels of formal education.

Health professionals are still considered as the most important source of health information but their perceived importance has decreased 10% in the period under analysis. Only pharmacies have also registered a negative evolution, although smaller. Among the general population, all the other sources of health information have registered increases in perceived importance, but the largest positive variation has been registered for “family, friends and colleagues.” In 2007, the Internet was rated as the most important source of health information by those using the Internet for health or illness purposes. The tendency for valorizing parochial and informal sources of health information, in detriment of the health professional, the pharmacy and other certified sources of health information is interesting and deserves attention, due to its meaning and future consequences.

7. Conclusions

Results from the two surveys conducted in 2005 and 2007 confirms that using the Internet for health related purposes is increasing in Portugal, particularly among young women. Portuguese women are using the media in a coherent way and more than men to get information on nutrition, diet and life style, pregnancy and children care, specific illnesses and several aspects related to the management of illness. This information is of great value to physicians, policy makers, insurance companies and telecommunications operators and should be taken in consideration during the medical encounter, when designing and implementing health policies and programs and when designing marketing strategies for hospitals and private clinics, insurance and telecommunications companies.

Health literacy may be an acute problem calling for attention, taking in consideration the growing number of people with low formal education using the Internet for health information and the decrease in perceived importance of doctors for health information.

An interesting market for health related organizations using the Internet as part of their business models seems to be developing in Portugal, with young women as the most promissory generic segment. Specific groups identified in this research must be studied in more detail, in order to develop value propositions well adjusted to their requirements, needs, values, attitudes and expectations.

References

1. Andreassen HK, Bujnowska-Fedak MM, Chronaki CE, et al. European citizens' use of E-health services: a study of seven countries. *BMC Public Health*. 2007;7:53.
2. Baker L, Wagner TH, Singer S, Bundorf MK. Use of the Internet and e-mail for health care information: results from a national survey. *Jama*. May 14 2003;289(18):2400-2406.
3. Dumitru RC, Burkle T, Potapov S, Lausen B, Wiese B, Prokosch HU. Use and perception of internet for health related purposes in Germany: results of a national survey. *Int J Public Health*. 2007;52(5):275-285.
4. Fox S. *Health Information Online – Eight in ten internet users have looked for health information online, with increased interest in diet, fitness, drugs, health insurance, experimental treatments, and particular doctors and hospitals*: Pew Internet & American Life Project; 2005.
5. CPME/SCED. *On information to patients and patient empowerment*: Comité Permanent des Médecins Européens/Standing Committee of European Doctors; 11 September 2004.
6. Ball MJ, Lillis J. E-health: transforming the physician/patient relationship. *Int J Med Inform*. Apr 2001;61(1):1-10.
7. Gaby S, Henman P. E-Health: transforming doctor-patient relationships with a dose of technology. Paper presented at: Australian Electronic Governance Conference; 14th and 15th April, 2004; Centre for Public Policy, University of Melbourne Victoria.
8. Harris R, Veinot T. *The empowerment model and using e-health to distribute information*: Action for Health 2004-01-WP-2; 2004.
9. Ball MJ, Smith C, Bakalar RS. Personal health records: empowering consumers. *J Healthc Inf Manag*. Winter 2007;21(1):76-86.
10. Chronacki C, Voss H, Santana S, Prokosch H-U. eHealth consumer attitude on online access to personal health records In: Cunningham P, Cunningham M, ed. *Expanding the knowledge economy: issues, applications, case studies*. Amsterdam: IOS Press; 2007.
11. Eysenbach G. Towards ethical guidelines for dealing with unsolicited patient emails and giving teleadvice in the absence of a pre-existing patient-physician relationship systematic review and expert survey. *J Med Internet Res*. Jan-Mar 2000;2(1):E1.
12. Adler KG. Web portals in primary care: an evaluation of patient readiness and willingness to pay for online services. *J Med Internet Res*. 2006;8(4):e26.
13. Ferguson T, Kelly B. E-patients prefer egroups to doctors for 10 of 12 aspects of health care. The Ferguson Report 1999;1. www.fergusonreport.com/articles/fr039905.htm. Accessed 21 March 2007.
14. Santana S, Sousa Pereira A. On the use of the Internet for health and illness issues in Portugal: repercussions in the physician-patient relationship. *Acta Med Port*. Jan-Feb 2007;20(1):47-57.
15. Spadaro R. *Eurobarometer 58.0. European Union Citizens and sources of information about health*. 2003.
16. Erkut S, Alarcón O, Coll C, Tropp L, HA VG. The dual-focus approach to creating bilingual measures. *Journal of Cross-Cultural Psychology*. March 1999;30(2):206-218.
17. INE. Bases de dados online; 2006.
18. Mesthene EG. *Technological change*. Boston: Harvard University Press; 1970.
19. UNESCO. *Technology education within the context of general education*. Paris: UNESCO; 1985.
20. Santana S, Szczygiel N, Sousa Pereira A. Perceptions on importance of online health services in Portugal. In: Cunningham P, Cunningham M, eds. *Expanding the Knowledge Economy: Issues, Applications, Case Studies*. Amsterdam: IOS Press; 2007:679-685.
21. Kreps GL. Disseminating relevant health information to underserved audiences: implications of the Digital Divide Pilot Projects. *J Med Libr Assoc*. Oct 2005;93(4 Suppl):S68-73.
22. Henwood F, Wyatt S, Hart A, Smith J. 'Ignorance is bliss sometimes': constraints on the emergence of the 'informed patient' in the changing landscapes of health information. *Sociol Health Illn*. Sep 2003;25(6):589-607.
23. Kickbusch IS. Health literacy: addressing the health and education divide. *Health Promot Int*. Sep 2001;16(3):289-297.
24. Cristmann S. *Health literacy and Internet: recommendations to promote health literacy by the means of the Internet*: EuroHealthNet, the European network for public health, health promotion and disease prevention; 2005.
25. Fox NJ, Ward KJ, O'Rourke AJ. The 'expert patient': empowerment or medical dominance? The case of weight loss, pharmaceutical drugs and the Internet. *Soc Sci Med*. Mar 2005;60(6):1299-1309.