European Network of Economic Policy
Research Institutes

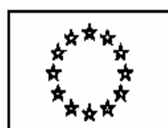
THE INFLUENCE OF SUPPLY AND DEMAND FACTORS ON AGGREGATE HEALTH CARE EXPENDITURE WITH A SPECIFIC FOCUS ON AGE COMPOSITION

ERIKA SCHULZ

ENEPRI RESEARCH REPORT NO. 16

AHEAD WP6, PART A: DATA COLLECTION RESULTS

NOVEMBER 2005



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ISBN 92-9079-603-0

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ENEPRI Research Report No. 16/November 2005

Erika Schultz*

Abstract

Expenditure on medical treatment has tended to increase as a proportion of national income throughout the European Union. Overall there has been a rising trend in the mean as low-spending countries such as the UK have faced political pressure to spend at least the average EU proportion of their national income on the provision of health services, medical treatment and long-term care. A particular concern is that with an ageing population and therefore the prospect of more old people around, the pressures on health care expenditure will increase further.

The aim of this 6th work package (WP6) of the AHEAD project is to explain how demand and supply factors influence aggregate health care expenditure with a specific focus on age composition. Several studies in the past have shown that health care expenditure is not only influenced by demand factors, but also by those on the supply side, particularly technological progress, political decisions and economic framework conditions.

In contrast with other studies (and aside from the focus on age), WP6 emphasises variables describing health care and financing systems. The idea is that the inclusion of these variables affords a better explanation of health care expenditure. This report collects data on demand, supply and utilisation of health care from official statistics and creates additional variables describing the health care and financing systems based on a literature review. In total, 63 variables are included in a basic data set for 28 countries, mostly covering the period 1980-2003. A brief statistical overview shows the development of some of the variables in the countries covered. The expected strong connection between health care expenditure and GDP can be seen in a cross-section analysis for 2003. The relation between health care expenditure and the share of the elderly in the population was also positive, but not as strong as in the case of GDP.

* Erika Schulz is with DIW, Berlin.

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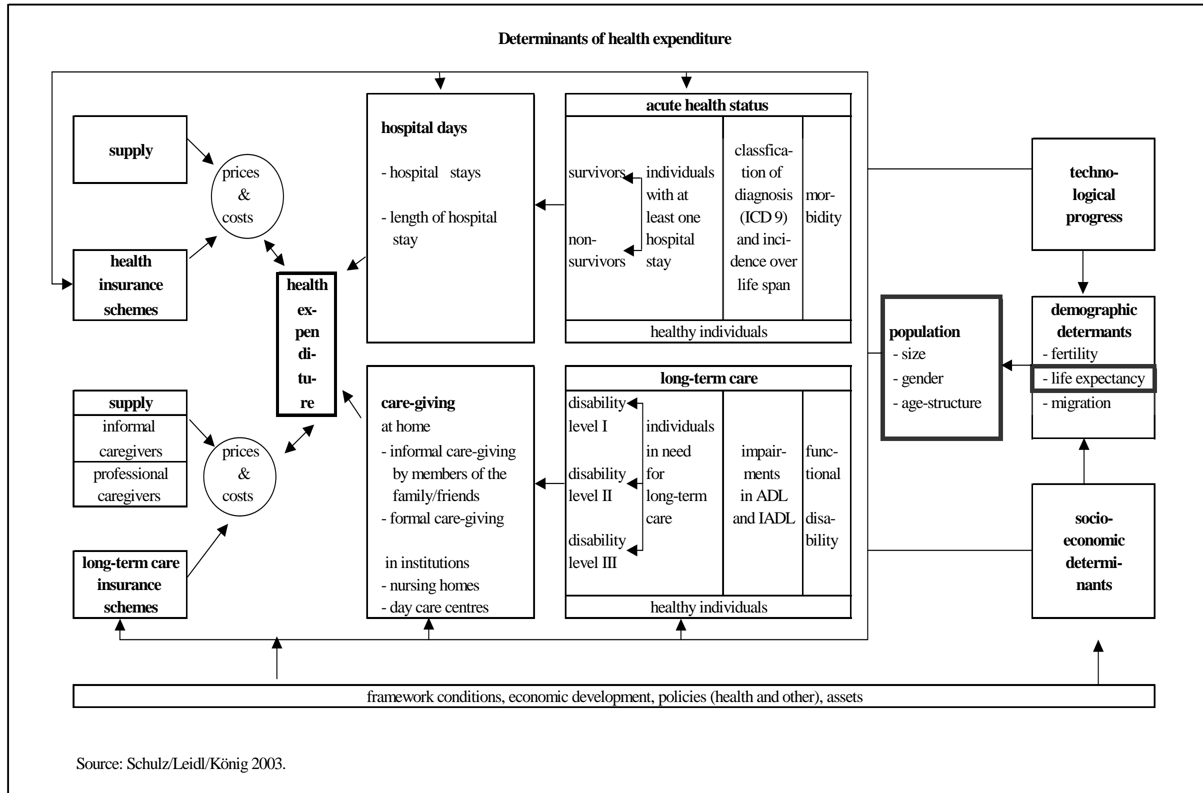
Introduction

Expenditure on medical treatment has tended to increase as a proportion of national income throughout the European Union. There has been a rising trend in the mean as low-spending countries such as the UK have faced political pressure to spend at least the average EU proportion of their national income on the provision of health services, medical treatment and long-term care. A particular worry is that with an ageing population and therefore the prospect of more old people around, the pressures on health care expenditure will increase further. This issue is of concern in its own right and because of its fiscal implications. Rising health expenditures in turn put pressure on the targets of the Stability and Growth Pact. They also prompt the question of whether budgetary targets should be tightened ahead of projected growth in public expenditures, so as to 'save up' for future spending and to keep expected future tax rates reasonably constant.

The main focus of the public discussion is the impact of an ageing society on health and long-term care expenditure. Cross-sectional data show a strong positive correlation between age and health expenditure (EPC, 2001). In all EU countries the picture is nearly the same: a strong increase with age. Therefore, it is expected that the ageing process could affect the sustainability of health care systems. But health expenditure is not only influenced by demand. In addition to demography, other important factors influence health expenditures, especially medical and technological progress, political decisions and economic framework conditions. A study for Germany showed that health expenditures were mostly influenced by technological progress and not by the ageing process (Breyer, 1999). The same results were observed for health care expenditures in the US (Okunade & Murthy, 2002).

Generally, the level of health expenditure is the result of demand and supply factors, political decisions (as well as those by health-care insurance schemes) and overall economic conditions (see Figure 1). Ageing could be an important factor on the demand side, but other factors may be more relevant for the development of health expenditure. Particularly in the new member states, changes in health care systems have an important influence on principally the supply side and therefore the development of health care expenditure. Thus the AHEAD project focuses on both demand and supply factors. Of specific interest is the study of the extent to which both factors respectively affect aggregate health expenditure, taking age composition into account. This study builds on the Ageing Health and Retirement (AGIR) project (Ref. No. QLK6-CT-2001-00517), which estimated the expected effect on health care expenditures of an ageing population as seen predominantly from the demand side. It adds to the AGIR study by including a composite of both demand- and supply-side factors influencing the aggregate expenditures. Hence, rather than making simple forecasts from demographic variables, it aims at making predictions of changes in aggregate expenditure owing to marginal changes in age composition by taking supply-side factors into account. The predictions are to be based on empirical evidence from the past (since 1980).

Figure 1. Determinants of health care expenditure



Several earlier studies have shown a positive association between aggregate income per capita and health care expenditures per capita. Newhouse (1977) based his study on data from 13 developed countries and his main findings revealed that 92% of the variation in medical expenditure per capita could be explained by the variation in national income per person. Later studies (Gerdtham et al., 1992) confirm that GDP per capita appears to be the most important statistical factor in the cross-national variation in health care expenditure. This point leads to the question of how much can be explained by other factors, especially the relevance of making forecasts on the basis of demand-side aspects such as demographic changes.

In Part A of the 6th AHEAD work package (WP6) a list of variables influencing health care expenditure is created based on various earlier empirical studies. Additional, institutional and system variables are included to account for the degree of central control on total health care spending, economic incentives, etc. The analyses are carried out for different groups of countries based on the availability of data. In general, data is collected for all 25 EU countries and the three candidate countries, for the period 1980-2003.

1. Variables

The variables used for the analyses can be classified as dependant variables and explanatory variables: demand factors, supply factors, those factors representing the overall conditions and variables reflecting the health care system and the financing of health care services.

1.1 Dependant variables

The aim of this part of the AHEAD project is to analyse the extent to which the development of health care expenditure is influenced by certain demand, supply and other factors. Thus total

health care expenditure can be used as a variable for the entire public and private spending on health care. Total health care expenditure is measured as 'total health care expenditure per capita in $US PPP'. The discourse about the sustainability of health care finances does not generally focus on total health care expenditure, but on that for public health care alone. Therefore, data on public health care expenditure is collected as well as that associated with private payments. Private payments can be separated into out-of-pocket payments, private insurance distributions and contributions to other private funds.

1.2 Demand factors

Total health care expenditure depends on the total number of inhabitants and the age structure of the population. A study for the EU-15 showed that in all countries health care expenditure increased with age (EPC, 2001). OECD health data provide the ratio of per capita health expenditure by age. Table 1 shows that the amount of health expenditure for the elderly (aged 65+) in most countries is around three or more times the amount spent on those aged 0-64. Among the elderly health expenditure is higher for persons aged 75+ than for those aged 65-74.

Table 1.Ratios of per capita expenditure by age

Country	Year	Pop. 65+ / pop. 0-64	Pop. 75+ / pop. 0-64	Pop. 65-74 / pop. 0-64
Czech Republic	1997	2.80	2.98	2.69
Finland	1990	3.95	5.52	2.81
France	1991	2.96	3.73	2.20
Germany	1994	2.68	3.17	2.34
Portugal	1993	1.70	2.14	1.40
Sweden	1990	2.83	3.43	2.30
Switzerland	1991	4.00	5.70	2.55
UK	1997	3.35	4.62	2.25

Source: OECD Health Data (2004a).

For the WP6 analyses the population is differentiated into the following age groups: 0-5, 6-19, 20-34, 35-49, 50-64, 65-74, 75-84 and 85+. The ageing of the population is attributed to increasing life expectancies, in particular for older persons, and low fertility rates. Therefore, the development of these variables is also of interest. The variables are the total fertility rate, the life expectancy at birth and life expectancy at age 65 for both men and women. The fertility rate is also an indicator of births among middle-aged women, which leads to an increase in health care expenditures. Additionally, the number of inhabitants is influenced by migration flows. Thus, the net migration per 1,000 inhabitants is included in the list of variables. The health behaviour of migrants is different from that of citizens, and for some groups of migrants – especially asylum seekers – the state covers health care costs and fixes a list of provided and covered services. Perhaps a separate focus on citizens and foreigners may lead to better results.

Empirical studies show that health expenditure is more related to nearness to mortality than to age. A crude indicator for the influence of mortality on health care expenditure could be the mortality rate per 1,000 inhabitants. To analyse whether such an indicator influences total health expenditure, the crude mortality rate is included in the data set.

Alongside demographic variables, other demand factors affect health care expenditure. First of all is health status. Empirical analyses based on the European Community Household Panel (ECHP) have shown that health status has a significant impact on the demand for acute and

long-term care, and is an important driver of health expenditure (Schulz, 2004). Thus, we wanted to include the share of persons in good health in the analyses.

Health behaviour is another important factor that influences health status as well as the direct demand for health care services. To measure health behaviour two indicators are used: alcohol consumption (litre per capita aged 15+) and tobacco consumption (in grams or in cigarettes per person per year).

Another important variable is education. Individuals with higher levels of education show healthier behaviour, tend to consult a doctor more often – perhaps for prevention – and have fewer hospital admissions (along with a shorter length of hospital stay) (Schulz, 2004). The results of regression analyses based on micro data lead to the inclusion of the education level of a population for analyses on an aggregate level. An indicator can be the share of persons with a low education level – i.e. level 0/1/2 from the ISCED classification.

Two utilisation indicators may also be included in the analyses: the number of physician consultations per 1,000 inhabitants and the occupancy rate of acute hospital beds.

1.3 Supply factors

Providing health care services and drugs incurs costs. Therefore, several indicators for the volume of services provided are included in the analyses. The indicators are: physicians per 1,000 inhabitants, in-patient care beds for acute care per 1,000 inhabitants, capacity in residential nursing homes/homes for the elderly, MRI scanners per million of the population, CT scanners per million of the population and dialyses per 100,000 inhabitants. The development of modern equipment and components could be an indicator for technological progress, which seems to be an important cost driver.

In some cases – in particular for elective surgeries – the supply is not great enough to meet the demand. As a result waiting lists exist. This variable is also included to indicate the countries in which such restrictions exist.

1.4 Framework conditions

The overall economic situation in a country determines the private and public spending on health care. A high living standard indicates the prosperity of a society to provide the basis for a broad spectrum of health care services and the application of new technologies. The living standard can be measured by the GDP per capita. In health care systems that are principally financed by taxes as well as those mainly financed by contributions to health care insurance schemes the amount of tax contributions depends on the added value or earnings/income. High economic growth rates assist the financing of public and private health care costs.

Another indicator of the economic situation is the unemployment rate. In most health care insurance systems the amount of the contribution depends on the individual income of the insured person and therefore the contributions of unemployed persons with low incomes are less than those of employed persons. Thus, high unemployment rates lead to lower revenues for health care insurance schemes and restrict the financial scope. In addition to this direct influence on the premium income of health care insurers, a long period of unemployment and the absence of prospects for obtaining a job in the near future could lead to an adverse impact on health behaviour. For example, long periods of unemployment could go in line with depression and higher levels of alcohol consumption. Therefore, unemployment could influence the demand for health care services.

Women's labour force participation rate is mostly relevant concerning the expenditure on long-term care. Care givers are generally women and the share of informal care givers is higher

among inactive persons than their active counterparts (Schulz, 2004). It can be expected that a high level of women's labour force participation reduces the possibilities for informal care-giving and in these cases long-term care has to be provided by professional care givers at home or in institutions. This consequence may have an increasing effect on this kind of health care expenditure.

1.5 Indictors classifying the health care systems

The way in which health systems are financed affects the degree of government control over health spending. Most EU countries have some form of publicly financed or administered health insurance schemes, but in some countries tax-financed systems have been introduced to cover the benefit package. Private health insurance is used to fill in the gaps in the benefit package or to absorb out-of-pocket payments.

Health care systems can be classified by the degree to which health care financing and delivery systems are publicly controlled or administered. The OECD uses three models to classify the systems (Docteur & Oxley, 2003):

- The public integrated model combines on-budget financing of health care provision with hospital providers that are part of the government sector. These systems are organised and operated like any government department. Staff are mostly public-sector employees and salaried. Ambulatory doctors can be either public employees or private contractors.
- In the public contract model, public payers contract with private health care providers. The payers can be either state agency or social security funds. In many public contract systems, private hospitals are run on a non-profit basis. Independent private contractors generally supply ambulatory care.
- The private insurance/private provider model uses private insurance combined with private providers. Insurance coverage can be compulsory or voluntary. Payment methods have traditionally been activity-based.

A pure form of the private insurance/private provider model is not common in EU countries. In most countries a mix of public and private insurance and private providers exists. Private insurance is mostly complementary, supplementary or duplicate. Only in some countries does a public integrated model exist.

In EU countries a mix of sources for health care revenues are common. Countries with systems that are mainly financed by taxes are Denmark, Finland, Ireland, Italy, Spain, Sweden, the UK, Latvia and Malta. Countries with systems that are predominantly funded by insurance contributions are France, Germany, Luxembourg and the Netherlands, along with new EU member states such as the Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia. For the most part the health care revenues in Austria stem from insurance contributions, but also from taxation and user charges/out-of-pocket payments. Therefore, the health care system is basically a contract system, although it has mixed financing. A mixed system also exists in Belgium, Greece, Portugal, Bulgaria, Lithuania, Romania and Turkey. Cyprus has a dual system with a public health system financed by taxation and a private health system with user charges and out-of-pocket contributions.

Table 2 shows the percentage of total expenditures on health care from taxation. In the new EU member states and the candidate countries the figures show the changes in the contribution of taxes to the financing of total health expenditure caused by changes in the political system, most markedly in the Czech Republic between 1992 and 1993, and in Estonia, Slovakia, Slovenia, Bulgaria and Romania (in different years).

Table 2. Percentage of total health expenditure financed by taxes

No	Countries	1980	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	Austria		13,5			12,6	13,2	13,7	13,8	13,9								
2	Belgium			39						38								
3	Denmark	86,5	85			83,4					82,8	82,3			82			
4	Finland	67,1				70,3					62,2	61,9	61,9	61,5	60,8			
5	France[1)]	4,3	3,6			2,3	2,2	2,1	2,1	2,3	2,4	2,4	2,5	2,5	2,5	2,6	2,7	2,4
6	Germany							13		12,9		10,8		8,1	8	7,9	7,8	7,8
7	Greece							40		30								
8	Ireland[1)]					71,1	72,2	70,6	72,3	71	70,7	70,5	73,8	75,7	72	72,4	74,9	74,6
9	Italy	80,5	77,2			78,1					67,7	67,8	68	68	67			
10	Luxembourg					20,9				14,7	15,4	14,8						
11	Netherlands	9				11					10					4,8	5,2	5,6
12	Portugal					65,5	62,8	59,6	63	63,4	61,7		64,8	67,9		68,5	69	
13	Spain				70										98			
14	Sweden														77,7			
15	UK				80,1	77,5	78,8		81,8	82	82,4	82,1	81,5					
16	Cyprus	no information																
17	Czech Republic						96,8	95,4	19,1	16,5	16,5	12,5	11,8	10,9	11,1	10,5	9,5	10,2
18	Estonia					100									10,9		10,8	10,7
19	Hungary						16,1		18,6		16,8		14	13,1	12,7	12,2		
20	Latvia													78,9	78,9			
21	Lithuania													7,4				
22	Malta	dual system, no infromation about the share of taxed based financing on total health expenditure																
23	Poland	100				94				70		76	73					
24	Slovakia											34,0	31,3	24,5	5,2	5,0	4,4	3,2
25	Slovenia						98,5			2,6	2,8	3,4	3,4	3,3				
26	Bulgaria				100					98		100	100			69,2		
27	Romania					100	100	100	100	100	100	100	100	36,2	21,6			
28	Turkey							46,1	46,7	46	43,1	43,1	43,4	40,4				

Sources: HIT reports
1) OECD data: health care expenditure from general government excluding social security on total HCE .

In order to classify the health care systems some additional indicators are used. One indicator describes whether a ‘gatekeeper’ system exists. Gatekeepers are mostly general practitioners (GPs) or family doctors who refer the patient for secondary and/or tertiary care (to specialists and hospitals). It is expected that a gatekeeper system is more efficient, because the patient is attended by one doctor before and after secondary and tertiary care. But this scheme works only if the patient is obliged to visit the same primary care physician after treatment by a specialist or in a hospital and if the GP receives the needed information about the conducted medical treatments. A gatekeeper system has the aim of reducing the treatment costs by avoiding duplicate tests.

Another indicator focuses on the co-payments and user charges involved in visiting a primary care doctor, a specialist or a dentist, or for an in-patient hospital stay or pharmaceuticals. User charges and co-payments are the main components of out-of-pocket payments, which along with private insurance contributions make up the majority of private health expenditure. User charges have been advocated as a source of additional revenue to slow down the necessary increase of taxation or contributions to fund health care services. Further, it is expected that user charges cap excessive demand, which can put added pressure on already escalating expenditures for covered health services. But on the other hand, user charges disproportionately affect lower income groups through changes in their utilisation of services. In Germany, for example,

increased user charges and co-payments for pharmaceuticals and medical aids have led to a reduction in doctor visits, especially by low-income patients (elderly persons and those with chronic diseases) although the total yearly co-payments are limited (2% and 1% respectively of the yearly income). Therefore, it could be that high user charges slows down the increase in total health care expenditure.

Table 3 shows the proportion of out-of-pocket payments in total health expenditure. Countries that have systems with a high share of out-of-pocket payments are Spain, Hungary, Poland and Turkey.

Table 3. Household out-of-pocket payments) as a percentage of total health expenditure*

	Countries	1980	1985	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003
1	Austria				14,9	15,6	17,6	17,9	18,2	18,6	18,2	17,5	
2	Belgium												
3	Denmark	11,4	13,6	16,0	16,3	16,2	16,3	16,6	16,1	15,9	15,8	15,8	15,8
4	Finland	18,4	18,3	15,5	20,5	20,3	19,7	19,4	20,3	20,4	20,2	20,0	19,0
5	France	12,8	14,4	11,4	10,8	10,5	10,3	10,3	10,3	10,5	10,2	9,8	10,0
6	Germany	10,3	11,2	11,1	10,0	10,1	10,8	11,2	10,9	10,5	10,6	10,4	10,4
7	Greece									44,9	43,6	46,0	46,5
8	Ireland	-9	14,4	16,5	15,5	14,6	13,5	10,7	14,0	13,5	11,9	13,2	
9	Italy	-9	-9	15,3	24,4	24,2	24,1	24,5	24,1	22,8	20,3	20,4	20,7
10	Luxembourg	7,2	9,2	5,5	6,2	7,2	7,5	7,6	7,4	7,5	7,5	11,9	
11	Netherlands							8,4	9,0	9,0	8,7	8,0	7,8
12	Portugal												
13	Spain				23,5	23,2	23,1	23,2	23,3	23,7	23,8	23,6	23,7
14	Sweden												
15	United Kingdom	8,6	-9	10,6	10,9	11,0							
16	Cyprus												
17	Czech Republic			2,6	7,3	7,5	8,3	8,1	8,5	8,6	8,6	8,4	8,4
18	Estonia												
19	Hungary				16,0	18,4	18,7	22,3	24,9	26,3	27,7	26,3	
20	Latvia												
21	Lithuania												
22	Malta												
23	Poland			8,3	27,1	26,6	28,0	34,6	28,9	30,0	28,1	27,6	
24	Slovakia						8,3	8,4	10,4	10,6	10,7	10,9	11,7
25	Slovenai												
26	Bulgaria												
27	Romania												
28	Turkey				29,7	30,8			29,1	27,6			

*) Household out-of-pocket expenditure comprise cost-sharing, self-medication and other expenditure paid directly by private households, irrespective of whether the contact with the health care system was established on referral or on the patient's initiative.
Source: OECD Health Data 2004 and 2005.

In many EU countries there is a supplementary or complementary private health-insurance system. Reductions in the statutory health benefits package in these systems tend to lead to an increase in supplementary, voluntary health-insurance contributions to cover the non-statutory services (for example co-payments for prostheses). Contributions to private insurance schemes are, along with out-of-pocket payments, another large part of private health expenditure.

The reimbursement systems of physicians and hospitals are also used to characterise the health care system. The way in which hospitals are remunerated sets different incentives for their financial management. A prospective global budget based on past performance for hospitals could be a tool for cost containment, if the global budget is fixed (with a ceiling on hospitals).

But the incentives for cost control are limited if the budget is retrospectively calculated on a full-cost basis. Critics claim that a global budget system is inflexible – that it does not reward more efficient departments and sets no incentives for better organisation within a hospital or more effective treatments. Remuneration on a per diem basis encourages increases in the hospital stays of patients. The most effective remuneration seems to be a diagnosis-related group (DRG) payment system. More and more countries are changing their hospital reimbursement system to a DRG-based method.

Other variables describing the health care system are the free choice of physicians and hospitals and the existence of waiting lists for specialist treatments or elective surgeries in hospitals. A free choice of physicians and hospitals is associated with two contrasting effects. One argument is that free choice stimulates competition among physicians and hospitals and will therefore have a slowing-down effect on health expenditure. Another argument is that free choice leads to more doctor visits and duplicate treatments because patients change physicians more often if they have the opportunity.

Waiting times for elective surgery are a main health policy concern in approximately half of the OECD countries (Hurst & Sicilliani, 2003). Mean waiting times for elective surgeries are above three months in several countries and maximum waiting times can stretch into years. Waiting times can lead to deterioration in health, loss of utility and extra costs. Waiting lists are mostly found in countries that combine public health insurance, low or no patient cost-sharing and constraints on surgical capacity. In these cases waiting lists are used as non-price rationing. But they generate high dissatisfaction among patients. Many countries take steps to reduce long waiting lists for elective surgery. Some have increased the capacity for surgery while others have combined maximum waiting-time targets with additional activity and changed incentives. In many cases improvements in the efficiency of surgical units could be implemented. Nevertheless, at present waiting lists exist in Denmark, England, Finland, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden, Hungary, Malta and Slovenia.

2 Data sources, availability and comparability across countries

2.1 Data sources

Data have been collected for all 25 EU member states and the 3 candidate countries for (where possible) the period 1980-2003. The main data source for the health care expenditure, demand and supply factors has been the OECD's *Health Data 2004*. For those countries with no information in this database the WHO's European Health for All Database has been used. In some cases missing data in the OECD time series between 1980 and 2003 have been filled in with WHO data, if this has seemed to fit in the time series. Population data stem from EUROSTAT. The indicators describing health care and the financing systems are author-created variables based on a review of the literature. The *Health Care Systems in Transition* reports from the European Observatory on Health Systems and Politics have provided the main information for individual countries; additional relevant literature has also been used, such as the MISSOC, MISSCEEC and other papers from the European Commission, along with OECD data and reports.

2.2 Data availability

The OECD *Health Data 2004* covers 19 EU countries: the EU-15 and the Czech Republic, Hungary, Poland and the Slovak Republic. In the new version of the data set for 2005, information about the health care expenditure of the non-OECD EU member states (Estonia, Lithuania, Latvia, Malta, Slovenia and Cyprus) for the year 2002 is also included. The OECD is used as the main database for health care expenditure, education, consultations with doctors, the

supply of health care services (physicians per 1,000 inhabitants, physicians per 100 hospital beds, acute-care beds per 1,000 inhabitants, MRI scanners per million inhabitants, CT scanners per million inhabitants and dialyses per 100,000 inhabitants), the acute-care occupancy rate, the population covered by the public health care system, GDP per capita in $US PPP and women's labour force participation rates. Where it has seemed possible, the OECD data have been combined with information from the WHO European Health for All Database for the non-OECD EU member states. Additionally, the WHO database has been used for life expectancies at birth and at age 65, as well as for the crude mortality rate, the health behaviour (alcohol and tobacco consumption) and for nursing and elderly home beds per 100,000 inhabitants. Population data stem from Eurostat. For the EU-15 information is mostly available for period 1980 to 2002-03. Data for the new member states are generally available from the beginning of the 1990s, but population and supply data are often available for longer periods (1980 or 1985 to 2002-03). OECD health data have also provided information about the share of the population in good health, but only for some countries and for certain years (different per individual country). Therefore, it has not been possible to integrate this variable into the data set. Another problem has been the lack of sufficient data for Cyprus and Malta.

2.3 Data comparability across countries

The OECD has the responsibility of ensuring that the data presented in the *Health Data 2004* report are as comparable as possible across countries and over time. To improve the quality of international comparisons, the *System of Health Accounts* (SHA) was published in May 2000 with guidelines for reporting health expenditure. Total expenditure on health in the SHA is defined as the sum of expenditures on activities that have the goal of:

- promoting health and preventing disease;
- curing illness and reducing premature mortality;
- caring for persons affected by chronic illness who require nursing care;
- caring for persons with health-related impairments, disabilities and handicaps who require nursing care;
- assisting patients to die with dignity;
- providing and administering public health; and
- providing and administering health programmes, health insurance and other funding arrangements.

Therefore, the SHA includes:

- services of curative care (HC.1);
- services of rehabilitative care (HC.2);
- services of long-term nursing care (HC.3);
- ancillary services to health care (HC.4);
- medical goods dispensed to out-patients (HC.5);
  = total expenditure on personal health (HC.1-HC.5);
- services of prevention and public health (HC.6);
- health administration and health insurance (HC.7);
  = total expenditure on collective health (HC.6+HC.7);
  = total current expenditure (HC.1-HC.7);
- investment in health (HC.R.1);
  = total expenditure on health (HC.1-HC.7+HC.R.1).

OECD member countries are at varying stages of reporting total health expenditure according to the definition of the SHA. In general the data fall into four groups:

The *first group* of countries closely follows the SHA definition just described. These are: Denmark, France, Germany, Hungary, the Netherlands, the UK, Spain and Turkey.

The *second group* has locally produced health accounts, which are similar to the SHA: Finland and Poland.

The *third group* has national accounts with numerous problems for international comparisons, such as:

- the level of detail is often minimal;
- certain elements of health care expenditure are reported as social services (which leads to underestimations of overall health expenditure) and most occupational health care is not reported in national accounts;
- the national accounts are not precise in defining what is included in health care;
- the availability of data on private health care expenditure is limited; and
- details on data sources and estimation methods are usually not published.

This third group of countries comprises Austria, the Czech Republic, Greece, Ireland, Italy, Luxembourg, Portugal, the Slovak Republic and Sweden.

Finally, Belgium comprises a *fourth group*, for which estimates are made by the OECD Secretariat based on the OECD National Account database.

In most countries there are breaks in the time series owing to changes in the reporting system, i.e. changes from national accounts (NA) or National Accounts Estimates (NAE) to SHA accounts, as follows for the country groups discussed above:

Group I – Germany 1970-90 (NA), 1992-2002 (SHA); Hungary 1991-97 (NA), 1998-2002 (SHA); the Netherlands 1972-1998 (NA), 1998-2001 (SHA); the UK 1960-96 (NAE), 1997-2002 (SHA); Spain 1960-98 public expenditure (NA) and private expenditure (NAE), 1999-2002 (SHA); and Turkey 1970-97 (OECD estimates), 1998 (NA), 1999-2000 (SHA).

Group III – Greece 1970, 1980 (OECD estimates), 1987-2002 (NAE); Portugal 1970-94 (OECD estimates), 1995-2002 (NAE).

The data on total health expenditure for the remaining countries (Cyprus, Estonia, Latvia, Lithuania, Malta, Slovenia, Bulgaria and Romania) stem from the WHO database. These countries reported the data directly. Health expenditure in some of these countries, particularly in the Eastern European ones, is likely to be underestimated, owing to the exclusion of the private sector and out-of-pocket payments (WHO, 2003, p. 98). But in the remaining new member states and candidate countries, for the most part some information about private health care expenditures is available as outlined below:

- Romania – private expenditure is only available for 1996 (4.1% of total health expenditure or THE);
- Slovenia – there is information about voluntary health insurance (11.6% of THE in 1998), but there is no data about direct payments;
- Lithuania – information about private health care expenditure exists (which was around 23% of THE in 1998);

- Latvia – different estimations about the level of out-of-pocket payment exist (e.g. estimated as 39% in 2000 by the WHO, 7-10% by the Ministry of Welfare and 21% for the period 1998-99);
- Bulgaria – only WHO estimates are available for out-of-pocket payments (18% in 2000);
- Estonia – information about out-of-pocket payments and private health insurance exists starting from 1999 (private health insurance in 2002 was around 24% of THE);
- Cyprus – a study offers information about out-of-pocket payments (around 4% of median household income in 2002); and
- Malta – while no co-payments are required for public health care, for private care out-of-pocket and private insurance payments do occur, but no exact data are available.

Health expenditure and financing data are the most important aspects in the data set, and use of the OECD health data ensures the most comparable data in this field. Data about population and age structure seem to be fully comparable and in any case Eurostat did not report any problems. Nor did the OECD report any problems for the other supply and demand factors.

The author-generated variables classifying the health care systems stem mainly from the *Health Care Systems in Transition* (HiT) reports from the European Observatory on Health Systems and Politics. The Observatory is a partnership among the WHO Regional Office for Europe, the governments of Belgium, Finland, Greece, Norway, Spain and Sweden, the Veneto Region of Italy, the European Investment Bank, the Open Society Institute, the World Bank, CRP-Santé Luxembourg, the London School of Economics and Political Science (LSE) and the London School of Hygiene & Tropical Medicine (LSHTM). The HiT profiles are produced by country experts in collaboration with the research directors and staff of the Observatory. In order to maximise comparability among countries, a standard template and questionnaire have been used. These provide the detailed guidelines and specific questions, definitions and examples needed to compile the HiT. Notes about the methodology used by the Observatory are reported on its website homepage as follows:

> Compiling the HiT profiles poses a number of methodological problems. In many countries, there is relatively little information available on the health care system and the impact of reforms. Most of the information in the HiTs is based on material submitted by experts in the respective countries, which is then reviewed by independent experts. Nonetheless, some statements and judgements may be coloured by personal interpretation. In addition, the absence of a single agreed terminology to cover the wide diversity of systems in the European Region means that variations in understanding and interpretation may occur. A set of common definitions has been developed in an attempt to overcome this, but some discrepancies may persist. These problems are inherent in any attempt to study health care systems on a comparative basis. (Retrieved from www.euro.who.int/observatory/Hits.)

Nevertheless, using the information from these reports seems to provide the most comparable analyses of the health care systems in the member states.

2.4 Basic data set for further analyses

The variables included in the basic data set and the time periods are shown in Table 4. With the exception of the self-reported health status, all the required information could be collected and introduced. In some cases missing years could be filled in by interpolation of data.

Table 4. Basic data set

<table>
<tr><th rowspan="2">Variable</th><th colspan="7">Countries</th></tr>
<tr><th>Austria</th><th>Belgium</th><th>Denmark</th><th>Finland</th><th>France</th><th>Germany</th><th>Greece</th></tr>
<tr><td>HEALTH CARE EXPENDITURE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>HCE US$ PPP (in million)</td><td colspan="4">1980-2002</td><td>1980,85,90-2002</td><td>1980-90,92-2002</td><td>1980,87-2002</td></tr>
<tr><td>HCE US$ PPP per capita</td><td colspan="4">1980-2002</td><td>1980,85,90-2002</td><td>1980-90,92-2002</td><td>1980,87-2002</td></tr>
<tr><td>Public expenditure US$ PPP (in million)</td><td>1980-2002</td><td>1995-2002</td><td colspan="2">1980-2002</td><td>1980,85,90-2002</td><td>1980-90,92-2003</td><td>1980,87-2003</td></tr>
<tr><td>Public expenditure US$ PPP per capita</td><td>1980-2002</td><td>1995-2002</td><td colspan="2">1980-2002</td><td>1980,85,90-2002</td><td>1980-90,92-2003</td><td>1980,87-2002</td></tr>
<tr><td>Public expenditure as % of total HCE (US$ PPP per capita)</td><td>1980-2002</td><td></td><td colspan="2">1980-2002</td><td>1980,85,90-2002</td><td>1980-90,92-2002</td><td>1980,87-2002</td></tr>
<tr><td>Private payment as % of total HCE</td><td>1980-2002</td><td>1995-2002</td><td colspan="2">1980-2002</td><td>1980,85,90-2002</td><td>1980-90,92-2002</td><td>1980,87-2002</td></tr>
<tr><td>Out-of-pocket payments (household) as % of total HCE</td><td>1995-2002</td><td></td><td colspan="2">1980-2002</td><td>1980,85,90-2002</td><td>1980-90,92-2002</td><td></td></tr>
<tr><td>Private insurance as % of total HCE</td><td>1980-2002</td><td></td><td colspan="2">1980-2002</td><td>1980,85,90-2002</td><td>1980-90,92-2002</td><td></td></tr>
<tr><td>All other privat funds as % of total HCE</td><td>1995-2002</td><td></td><td colspan="2">1980-2002</td><td>1980,85,90-2002</td><td>1980-90,92-2002</td><td></td></tr>
<tr><td>DEMAND FACTORS</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Population</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>total population at 1. January</td><td colspan="7">1980-2003</td></tr>
<tr><td>foreigners as share of total population</td><td>1980-2001</td><td>1981-2001</td><td colspan="2">1980-2001</td><td>1982,90,99</td><td>1980-2001</td><td>2001</td></tr>
<tr><td>age-composition as share of total
0-5,6-19,20-34,35-49,50-64,65-74,75-84,85+</td><td colspan="7">1980-2003</td></tr>
<tr><td>life expectancy at birth</td><td>1980-2002</td><td>1980-97</td><td>1980-99</td><td>1980-2002</td><td>1980-2000</td><td>1990-2001</td><td>1980-2001</td></tr>
<tr><td>male</td><td>1980-2002</td><td>1980-97</td><td>1980-99</td><td>1980-2002</td><td>1980-2000</td><td>1990-2001</td><td>1980-2001</td></tr>
<tr><td>female</td><td>1980-2002</td><td>1980-97</td><td>1980-99</td><td>1980-2002</td><td>1980-2000</td><td>1990-2001</td><td>1980-2001</td></tr>
<tr><td>life expectancy at 65</td><td>1980-2002</td><td>1980-97</td><td>1980-99</td><td>1980-2002</td><td>1980-2000</td><td>1990-2001</td><td>1980-2001</td></tr>
<tr><td>male</td><td>1980-2002</td><td>1980-97</td><td>1980-99</td><td>1980-2002</td><td>1980-2000</td><td>1990-2001</td><td>1980-2001</td></tr>
<tr><td>female</td><td>1980-2002</td><td>1980-97</td><td>1980-99</td><td>1980-2002</td><td>1980-2000</td><td>1990-2001</td><td>1980-2001</td></tr>
<tr><td>total fertility rate</td><td>1980-2002</td><td>1980-2002</td><td>1980-2002</td><td>1980-2002</td><td>1980,83,85-2001</td><td>1980,90-2001</td><td>1980,83,89-2001</td></tr>
<tr><td>migration per 1000 inhabitants</td><td colspan="7">1980/84,1985/89,1990/94,1995/99,2000-02</td></tr>
<tr><td>crude death rate per 1000 population</td><td>1980-2002</td><td>1980-97</td><td>1980-99</td><td>1980-2002</td><td>1980-2000</td><td>1990-2001</td><td>1980-2001</td></tr>
<tr><td>Other demand factors</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>health status (share of people in bad health)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>health behaviour: alcohol consumption</td><td colspan="5">1980-2001</td><td>1990-2001</td><td>1980-2001</td></tr>
<tr><td>health behaviour: tobacco consumption</td><td colspan="5">1980-2000</td><td>1990-2000</td><td>1980-2000</td></tr>
<tr><td>education level - attainment ISCED 0/1/2</td><td>1989-2002</td><td>1989-2002</td><td>1990-2002</td><td>1989-2002</td><td>1989-2002</td><td>1989-2002</td><td>1990-91,93-2002</td></tr>
<tr><td>education level - attainment ISCED 3/4</td><td>1989-2002</td><td>1989-2002</td><td>1990-2002</td><td>1989-2002</td><td>1989-92,94-2002</td><td>1989-2002</td><td>1990-91,93-2002</td></tr>
<tr><td>education level - attainment ISCED 5B</td><td>1993-2002</td><td>1989-2002</td><td>1990-2002</td><td>1989-2002</td><td>1989-2002</td><td>1989-2002</td><td>1990-91,93-2002</td></tr>
<tr><td>education level - attainment ISCED 5A/6</td><td>1989,91-2002</td><td>1989,91-2002</td><td>1991-2002</td><td>1989,91-2002</td><td>1989,91-2002</td><td>1989,91-2002</td><td>1990-91,93-2002</td></tr>
<tr><td>Utilisation of health care services</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>doctor's consultation per capita</td><td>1980-2002</td><td>1980-2002</td><td>1980-87,89-2002</td><td>1980-2002</td><td>1980-2001</td><td>1990-2000</td><td>1980-98</td></tr>
<tr><td>SUPPLY FACTORS</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Supply of health care services</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>physicians per 1 000 inhabitants</td><td>1980-2002</td><td>1980-2002</td><td>1980-82,84-2002</td><td>1980-2002</td><td>1980-2002</td><td>1990-2002</td><td>1980-2001</td></tr>
<tr><td>physicians per 100 hospital beds</td><td>1980-2002</td><td>1983-2001</td><td>1980-82,84-2001</td><td>1986-2002</td><td>1990-2001</td><td>1991-2001</td><td>1980-96,99-2000</td></tr>
<tr><td>acute care beds per 1 000 inhabitants</td><td>1980-2002</td><td>1980-1997</td><td>1980-2001</td><td>1980-2003</td><td>1980-2001</td><td>1991-2001</td><td>1980,84-85,89-2000</td></tr>
<tr><td>acute care occupancy rate % of available beds</td><td>1981-2002</td><td>1980-1998</td><td>1980-2001</td><td>1984-95</td><td>1980-2001</td><td>1980-2001</td><td>1980-99</td></tr>
<tr><td>nursing and elderly home beds per 100 000 inhabitants</td><td>1990-2002</td><td>1986,88-97</td><td>1980-2002</td><td></td><td>1980-2001</td><td>1990-97,99,2001</td><td>1980-89</td></tr>
<tr><td>MRI (and CT scanners) per million inhabitants</td><td>86-89,91-93,95-02</td><td>1989-90,93-97</td><td>1989-90,98-2002</td><td>1983-2002</td><td>1986-2001</td><td>1990-2001</td><td>1989-92,96-98,2001-02</td></tr>
<tr><td>(MRI and) CT scanners per million inhabitants</td><td>86-90,92-93,95-02</td><td>1989-90,93-94</td><td>1980-2002</td><td>1980-2002</td><td>1984-2001</td><td>1990-2001</td><td>1980,84-85,89-92,96-97,2001-02</td></tr>
<tr><td>dialyses per 100 000 inhabitants</td><td>1980-2002</td><td>1980-94</td><td>1980-2002</td><td>1980-2002</td><td>1980-95,2000-01</td><td>1980-2002</td><td>1980-2002</td></tr>
</table>

Table 4. Continued

Variable	Countries Austria	Belgium	Denmark	Finland	France	Germany	Greece
HEALTH CARE EXPENDITURE							
HCE US$ PPP (in million)	1980-2002				1980,85,90-2002	1980-90,92-2002	1980,87-2002
HCE US$ PPP per capita	1980-2002				1980,85,90-2002	1980-90,92-2002	1980,87-2002
Public expenditure US$ PPP (in million)	1980-2002	1995-2002	1980-2002		1980,85,90-2002	1980-90,92-2003	1980,87-2003
Public expenditure US$ PPP per capita	1980-2002	1995-2002	1980-2002		1980,85,90-2002	1980-90,92-2003	1980,87-2002
Public expenditure as % of total HCE (US$ PPP per capita)	1980-2002		1980-2002		1980,85,90-2002	1980-90,92-2002	1980,87-2002
Private payment as % of total HCE	1980-2002	1995-2002	1980-2002		1980,85,90-2002	1980-90,92-2002	1980,87-2002
Out-of-pocket payments (household) as % of total HCE	1995-2002		1980-2002		1980,85,90-2002	1980-90,92-2002	
Private insurance as % of total HCE	1980-2002		1980-2002		1980,85,90-2002	1980-90,92-2002	
All other privat funds as % of total HCE	1995-2002		1980-2002		1980,85,90-2002	1980-90,92-2002	
DEMAND FACTORS							
Population							
total population at 1. January	1980-2003						
foreigners as share of total population	1980-2001	1981-2001	1980-2001		1982,90,99	1980-2001	2001
age-composition as share of total 0-5,6-19,20-34,35-49,50-64,65-74,75-84,85+	1980-2003						
life expectancy at birth	1980-2002	1980-97	1980-99	1980-2002	1980-2000	1990-2001	1980-2001
male	1980-2002	1980-97	1980-99	1980-2002	1980-2000	1990-2001	1980-2001
female	1980-2002	1980-97	1980-99	1980-2002	1980-2000	1990-2001	1980-2001
life expectancy at 65	1980-2002	1980-97	1980-99	1980-2002	1980-2000	1990-2001	1980-2001
male	1980-2002	1980-97	1980-99	1980-2002	1980-2000	1990-2001	1980-2001
female	1980-2002	1980-97	1980-99	1980-2002	1980-2000	1990-2001	1980-2001
total fertility rate	1980-2002	1980-2002	1980-2002	1980-2002	1980,83,85-2001	1980,90-2001	1980,83,89-2001
migration per 1000 inhabitants	1980/84,1985/89,1990/94,1995/99,2000-02						
crude death rate per 1000 population	1980-2002	1980-97	1980-99	1980-2002	1980-2000	1990-2001	1980-2001
Other demand factors							
health status (share of people in bad health)							
health behaviour: alcohol consumption	1980-2001					1990-2001	1980-2001
health behaviour: tobacco consumption	1980-2000					1990-2000	1980-2000
education level - attainment ISCED 0/1/2	1989-2002	1989-2002	1990-2002	1989-2002	1989-2002	1989-2002	1990-91,93-2002
education level - attainment ISCED 3/4	1989-2002	1989-2002	1990-2002	1989-2002	1989-92,94-2002	1989-2002	1990-91,93-2002
education level - attainment ISCED 5B	1993-2002	1989-2002	1990-2002	1989-2002	1989-2002	1989-2002	1990-91,93-2002
education level - attainment ISCED 5A/6	1989,91-2002	1989,91-2002	1991-2002	1989,91-2002	1989,91-2002	1989,91-2002	1990-91,93-2002
Utilisation of health care services							
doctor's consultation per capita	1980-2002	1980-2002	1980-87,89-2002	1980-2002	1980-2001	1990-2000	1980-98
SUPPLY FACTORS							
Supply of health care services							
physicians per 1 000 inhabitants	1980-2002	1980-2002	1980-82,84-2002	1980-2002	1980-2002	1990-2002	1980-2001
physicians per 100 hospital beds	1980-2002	1983-2001	1980-82,84-2001	1986-2002	1990-2001	1991-2001	1980-96,99-2000
acute care beds per 1 000 inhabitants	1980-2002	1980-1997	1980-2001	1980-2003	1980-2001	1991-2001	1980,84-85,89-2000
acute care occupancy rate % of available beds	1981-2002	1980-1998	1980-2001	1984-95	1980-2001	1980-2001	1980-99
nursing and elderly home beds per 100 000 inhabitants	1990-2002	1986,88-97	1980-2002		1980-2001	1990-97,99,2001	1980-89
MRI (and CT scanners) per million inhabitants	86-89,91-93,95-02	1989-90,93-97	1989-90,98-2002	1983-2002	1986-2001	1990-2001	1989-92,96-98,2001-02
(MRI and) **CT** scanners per million inhabitants	86-90,92-93,95-02	1989-90,93-94	1980-2002	1980-2002	1984-2001	1990-2001	1980,84-85,89-92,96-97,2001-02
dialyses per 100 000 inhabitants	1980-2002	1980-94	1980-2002	1980-2002	1980-95,2000-01	1980-2002	1980-2002

Table 4. Continued

Variable	Countries: Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	Sweden	UK
HEALTH CARE EXPENDITURE								
HCE US$ PPP (in million)	1980-2002	1988-2003				1980-2002		
HCE US$ PPP per capita	1980-2002	1988-2002				1980-2002		
Public expenditure US$ PPP (in million)	1980-2002	1988-2003	1980-2002	1980-97			1980-2002	
Public expenditure US$ PPP per capita	1980-2002	1988-2002	1980-2002	1980-97			1980-2002	
Public expenditure as % of total HCE (US$ PPP per capita)	1980-2002	1988-2003	1980-2002	1980-97			1980-2002	
Private payment as % of total HCE	1980-2002	1988-2003	1980-2002	1980-97			1980-2002	
Out-of-pocket payments (household) as % of total HCE	1983-2002	1988-2003	1980-2002	1998-2002		1991-2002		1980,90-96
Private insurance as % of total HCE	1989-2002	1990-2003	1999-2002	1998-2002	1981-97	1980-2002		1980-96
All other privat funds as % of total HCE	1989-2002	1988-2003	1999-2002	1999-2002	1995-99	1991-2002		1990-96
DEMAND FACTORS								
Population								
total population at 1. January	1980-2003	1980-2001			1980-2003			1980-2001
foreigners as share of total population	1986-2001		1980-2001		1988-2001	1986-2001	1980-2001	1984-2001
age-composition as share of total 0-5,6-19,20-34,35-49,50-64,65-74,75-84,85+	1986-2003				1980-2003			1980-2001
life expectancy at birth	1980-2001	1980-2001	1980-2002	1980-2000	1980-2002	1980-2001	1980-2001	1980-2002
male	1980-2001	1980-2001	1980-2002	1980-2000	1980-2002	1980-2001	1980-2001	1980-2002
female	1980-2001	1980-2001	1980-2002	1980-2000	1980-2002	1980-2001	1980-2001	1980-2002
life expectancy at 65	1980-2001	1980-2001	1980-2002	1980-2000	1980-2002	1980-2001	1980-2001	1980-2002
male	1980-2001	1980-2001	1980-2002	1980-2000	1980-2002	1980-2001	1980-2001	1980-2002
female	1980-2001	1980-2001	1980-2002	1980-2000	1980-2002	1980-2001	1980-2001	1980-2002
total fertility rate	1980-2002	1980-2001	1980-2002	1980,83,89-2002	1980-81,83,85-2001	1980,83,89-95,97-2001	1980-2002	1980-2001
migration per 1000 inhabitants								
crude death rate per 1000 population		1980-2001	1980-2002	1980-2000	1980-2002	1980-2001		1980-2002
Other demand factors								
health status (share of people in bad health)								
health behaviour: alcohol consumption			1980-2001			1980-1996		1980-2001
health behaviour: tobacco consumption		1980-2000		1980-2000		1981-2000		1980-2000
education level - attainment ISCED 0/1/2	1989-2003	1989-2002	1994-96,98-2002	1989-2002	1989-91,93-2002	1989-2002	1989-2002	1989-2002
education level - attainment ISCED 3/4	1989-2003	1989-2002	1994-96,98-2002	1989-2002	1989-91,93-2002	1989-2002	1989-2002	1989-2002
education level - attainment ISCED 5B	1989-2003		1998-2002	1989-91,98-2002	1989-91,93-2002	1991-2002	1989-96,99-2002	1989-2002
education level - attainment ISCED 5A/6	1989,91-2003	1989,91-2002	1994-96,98-2002	1989-96,98-2002	1989-91,93-2002	1989,91-2002	1989,91-2002	1989,91-2002
Utilisation of health care services								
doctor's consultation per capita		1980-88,90-91,93-94,98-2000	1995-2002	1980-2002	1980-2001	1986-87,92-97,2000-01	1980-2001	1980-2000
SUPPLY FACTORS								
Supply of health care services								
physicians per 1 000 inhabitants	1991-2002	1980,83-2001	1980-2002	1980-91,97-02	1980-2002	1998-2002	1980-2000	1980-99,2001-02
physicians per 100 hospital beds	1980-81,83-2001	1984,86-88,90-2001	1983-2001	1983-91,98-2001	1980-2001	1989-98,2000	1980-97	1980-81,85-93
acute care beds per 1 000 inhabitants	1980-2002	1980-2001	1980,84-02	1980-2001	1980-2001	1995-2002	1980-2000	1980-2002
acute care occupancy rate % of available beds	1980-2002	1980-2001	1980,84-85,87-94,98-2002	1980-2001	1984-2001	1983-2000	1980-96	1980-86,94-2001
nursing and elderly home beds per 100 000 inhabitants	1980-90,94-98,2000-02		1986-97	1990-2001		1980,85-98	1980-99	1980-99
MRI (and CT scanners) per million inhabitants		1989-2002	1989-2002	1985-95	1989-90,96-97	1983-84,87-88,91-2002	1983-95,98-99	1985-95,98-2002
(MRI and) **CT** scanners per million inhabitants	1985-86,89-90	1989-2002	1989-90,93-2002	1980-81,83-84,89-93	1989-90,96-97	1983-94,87-88,91-2002	1980-93,98-99	1985-90,92-93,97-2002
dialyses per 100 000 inhabitants	1980-95	1980-95	1993-2002	1980-96	1980-91,96-2002	1980-99	1980-95	1980-91,94-95,97-98,2000-02

Table 4. Continued

Variable	Countries: Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	Sweden	UK
HEALTH CARE SYSTEM								
Organisational structure								
Health care system (public contract, public integrated, mixed)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Gatekeeper to non-acute hospital treatment or specialist	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Free choice GP or family doctor	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Free choice of specialists	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Free choice of hospitals	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Free choice of dentists	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Waiting lists for specialist care	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
waiting lists for surgeries in hospitals	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Financing the health care system								
Population covered by public health system % of total population	1980-2000	1980-97	1980-83,92-2002	1980-2001	1980-2002	1980-97	1980-2003	1980-2002
Multiple or single source financing system	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
population covered by privates health insurance	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payment in connection with GP visits	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payment in connection with specialists visits	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payment in connection with hospital admission	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payments in connection with dentist care	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co.payments for pharmaceuticals	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of hospitals (global budget, fee-for-service, per diem, per discharge)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of physicians in hospitals (fee-for-service, fixed salary)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of general practitioner (fee-for-service, salary, capitation)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of specialists (fee-for-service, salary, capitation)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of dentists (fee-for-service, salary, capitation)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Overall ceiling of hospital expenditure		1980-2003					1980-2003	
FRAMEWORK CONDITIONS								
Gross domestic product per capita, US$ PPP				1980-2002				
female labour force participation (18-65?)				1980-2002				
unemployment rate in % of labor force	1980-2002	1980-2001	1980-2002	1980-2002	1980-2002	1980-2000	1980-2002	1980-2000

Sources:
EUROSTAT
OECD health Data 2004, Version 1
European health for all database, WHO Regional Office for Europe, Copenhagen, Denmark.
Own created variables based on literatur review

Table 4. Continued

Variable	Countries: Cyprus	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta
HEALTH CARE EXPENDITURE							
HCE US$ PPP (in million)	2001	1990-2002	1992-95,98-2001	1991-2002	1990-95,97-2001		1999-2001
HCE US$ PPP per capita	2001	1990-2002	1992-95,98-2001	1991-2002	1990-95,97-2001		1999-2001
Public expenditure US$ PPP (in million)	2001	1990-2002	1998-2001	1991-2002	1990-95,97-2001		1999-2001
Public expenditure US$ PPP per capita	2001	1990-2002	1998-2001	1991-2002	1990-95,97-2001		1999-2001
Public expenditure as % of total HCE (US$ PPP per capita)	1980-2001	1980,85,89-2002	1996-2002	1991-2002	1990-2002	1987-2002	1999-2002
Private payment as % of total HCE		1980,85,89-2002		1991-2002			
Out-of-pocket payments (household) as % of total HCE		1990-2002		1991-2002			
Private insurance as % of total HCE				1998-2002			
All other privat funds as % of total HCE				1998-2002			
DEMAND FACTORS							
Population							
total population at 1. January	1980-2003						1980-2002
foreigners as share of total population		1992-2001		1994-97,99-2001			
age-composition as share of total 0-5,6-19,20-34,35-49,50-64,65-74,75-84,85+	2000-2002	1980,85,90-2003	1989,2000-03	1980,85,90-2003	1980,85,90-2003	1980,85,89-2003	1995-97,99-2002
life expectancy at birth	1999-2001	1980-84.86-2002	1981-82,85-2002	1980-2002	1980-2002	1980-2002	1980-2002
male	1999-2001	1980-84.86-2002	1981-82,85-2002	1980-2002	1980-2002	1980-2002	1980-2002
female	1999-2001	1980-84.86-2002	1981-82,85-2002	1980-2002	1980-2002	1980-2002	1980-2002
life expectancy at 65	1999-2001	1986-2002	1981-82,85-2002	1980-2002	1980-2002	1980-2002	1980-2002
male	1999-2001	1986-2002	1981-82,85-2002	1980-2002	1980-2002	1980-2002	1980-2002
female	1999-2001	1986-2002	1981-82,85-2002	1980-2002	1980-2002	1980-2002	1980-2002
total fertility rate	1980-2001	1980-2002	1980-2002	1980,83,89-2002	1980,85-2002	1980-2002	1985-2002
migration per 1000 inhabitants	1980/84,1985/89,1990/94,1995/99,2000-02						
crude death rate per 1000 population	1999-2001	1980-84,86-2002	1981-82,85-2002	1980-2002		1981-2002	1980-2002
Other demand factors							
health status (share of people in bad health)							
health behaviour: alcohol consumption	1980-2001		1992-2001	1980-2001		1984-90,92,95-2001	1988-2001
health behaviour: tobacco consumption		1993-98	1995-96	1980-97,99-2000		1995-2000	1980-83
education level - attainment ISCED 0/1/2		1993-2002		1995-2002			
education level - attainment ISCED 3/4		1993-2002		1995-2002			
education level - attainment ISCED 5B				1999-2002			
education level - attainment ISCED 5A/6		1993-2002		1995-2002			
Utilisation of health care services							
doctor's consultation per capita		1980-2002		1993-2002			
SUPPLY FACTORS							
Supply of health care services							
physicians per 1 000 inhabitants	1980-2001	1994-2002	1980,85-2002	1980-2002	1980,85-2002	1980-2002	1981-82,84,87-93,97-2000,02
physicians per 100 hospital beds	1980-2001	1980-2002	1980,85-2002	1981-83,85-99,2002	1980,1985-2002	1980-2002	1984,87-89,93,97-2000,02
acute care beds per 1 000 inhabitants	1980-2001	1984-2000	1980,85-2002	1980-2002	1998-2002	1992-2002	1997-2002
acute care occupancy rate % of available beds	1980-2001	1980-2002	1980,85-2002	1980-2002		1992-2002	1997-2002
nursing and elderly home beds per 100 000 inhabitants		1980-2002	1996-2002	1980-94,96-2002		1990-2002	2002
MRI (and CT scanners) per million inhabitants		1990-2002		1984-2002			
(MRI and) **CT** scanners per million inhabitants		1990-2002		1980-2002			
dialyses per 100 000 inhabitants		1980-95		1980-96			

Table 4. Continued

Variable	Countries Cyprus	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta
HEALTH CARE SYSTEM							
Organisational structure							
Health care system (public contract, public integrated, mixed)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Gatekeeper to non-acute hospital treatment or specialist	1980-2003	1980-2003	1998-2003	1992-2003	1992-2003	1990-2003	1980-2003
Free choice GP or family doctor	1980-2003	1993-2003	1992-2003	1992-2003	1980-2003	1991-2003	1980-2003
Free choice of specialists	1980-2003	1993-2003	1992-2003	1992-2003	1980-2003	1991-2003	1980-2003
Free choice of hospitals	1980-2003	1993-2003	1992-2003	1992-2003	1992-2003	1991-2003	1980-2003
Free choice of dentists	1980-2003	1993-2003	1992-2003	1992-2003	1991-2003	1991-2003	1980-2003
Waiting lists for specialist care	1980-2003	1980-2003	1992-2003	1991-2003	1991-2003	1991-2003	1980-2003
waiting lists for surgeries in hospitals	1980-2003	1980-2003	1992-2003	1990-2003	1991-2003	1991-2003	1980-2003
Financing the health care system							
Population covered by public health system % of total population		1980-2002		1980-2002			
Multiple or single source financing system	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
population covered by privates health insurance	1980-2003	1993-2003	1993-2003	1992-2003	n.a.	1991-2003	n.a.
Co-payment in connection with GP visits	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payment in connection with specialists visits	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payment in connection with hospital admission	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payments in connection with dentist care	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co.payments for pharmaceuticals	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of hospitals (global budget, fee-for-service, per diem, per discharge)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of physicians in hospitals (fee-for-service, fixed salary)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of general practitioner (fee-for-service, salary, capitation)	1980-2003	1993-2003	1992-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of specialists (fee-for-service, salary, capitation)	1980-2003	1993-2003	1992-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of dentists (fee-for-service, salary, capitation)	1980-2003	1993-2003	1992-2003	1980-2003	1980-2003	1991-2003	1980-2003
Overall ceiling of hospital expenditure			1992-2003	1990-2003		1991-2003	1980-2003
FRAMEWORK CONDITIONS							
Gross domestic product per capita, US$ PPP							
female labour force participation (18-65?)							
unemployment rate in % of labor force	1980-2001	1990-2002	1989-2002	1990-2002	1992-2002	1991-2002	1983,85-2002

Sources:
EUROSTAT
OECD health Data 2004, Version 1
European health for all database, WHO Regional Office for Europe, Copenhagen, Denmark.
Own created variables based on literatur review

Table 4. Continued

Variable	Countries: Poland	Slovakia	Slovenia	Bulgaria	Romania	Turkey
HEALTH CARE EXPENDITURE						
HCE US$ PPP (in million)	1990-2002	1997-2002	1989-2001	1988-1994	1988-90,92-2001	1980-2000
HCE US$ PPP per capita	1990-2002	1997-2002	1989-2001	1988-1994	1988-90,92-2001	1980-2000
Public expenditure US$ PPP (in million)	1990-2002	1997-2002	1989-2001	1988-1994	1988-90,92-2001	1980,84-2000
Public expenditure US$ PPP per capita	1990-2002	1997-2002	1989-2001	1988-1994	1988-90,92-2001	1980,84-2000
Public expenditure as % of total HCE (US$ PPP per capita)	1990-2002	1997-2002	1980,85-2001	1988-1994	1985-2001	1980,84-2000
Private payment as % of total HCE	1990-2002	1997-2002				1980,84-2000
Out-of-pocket payments (household) as % of total HCE	1990-2002	1997-2002				1992-96,99-2000
Private insurance as % of total HCE		1996-98				1984-87,91,94,99-2000
All other privat funds as % of total HCE						1999-2000
DEMAND FACTORS						
Population						
total population at 1. January	1980-2003 (Poland–Slovakia)			1980-2003 (Bulgaria–Romania)		1985-2003
foreigners as share of total population	1999	1993-2001				
age-composition as share of total 0-5,6-19,20-34,35-49,50-64,65-74,75-84,85+	1980,85,90-2003	1980-2003	1985,90-2003	1980-81,85-86,90-2003	1980,85,90-2002	1985-2003
life expectancy at birth	1980-2002	1980,82,84-2002	1985-2002	1980-2002	1980-2002	1980-2001
male	1980-2002	1980,82,84-2002	1985-2002	1980-2002	1980-2002	1980-99
female	1980-2002	1980,82,84-2002	1985-2002	1980-2002	1980-2002	1980-99
life expectancy at 65	1980-2002	1986-2002	1985-2002	1980-2002	1980-2002	
male	1980-2002	1986-2002	1985-2002	1980-2002	1980-2002	
female	1980-2002	1986-2002	1985-2002	1980-2002	1980-2002	
total fertility rate	1980,83,89-2001	1980-2002	1980,85,87-2002	1980-81,83-2002	1980,83,85-2002	1980-2002
migration per 1000 inhabitants	1980/84, 1985/89, 1990/94, 1995/99, 2000-02 (Poland–Slovenia)			1980/84,1985/89,1990/94,1995/99,2000-02 (Bulgaria–Romania)		
crude death rate per 1000 population	1980-2002	1986-2002	1985-2002			1980,85,89-90,92,94-98
Other demand factors						
health status (share of people in bad health)						
health behaviour: alcohol consumption	1980-2001 (Poland–Slovakia)		1981-2001			
health behaviour: tobacco consumption	1980-2000	1993-2000	1996-2000	1980-2000	1991-97	1980-98
education level - attainment ISCED 0/1/2	1994-2002	1996-2002				1990-2002
education level - attainment ISCED 3/4	1994-2002	1996-2002				1990-2002
education level - attainment ISCED 5B	1994-96	1996-2002				
education level - attainment ISCED 5A/6	1994-2002	1996-2002				1991-2002
Utilisation of health care services						
doctor's consultation per capita	1980-2002	1993-2002				1980-81,92-2002
SUPPLY FACTORS						
Supply of health care services						
physicians per 1 000 inhabitants	1980-2002	1980,83,84-95,98-2002	1980,82,84-2002	1980-2002	1980-2002	1980-2002
physicians per 100 hospital beds	1985-2001	1980,82,84-95,98-2002	1980,82,84-2002	1980-2002	1980-82,84-2002	1980-2001
acute care beds per 1 000 inhabitants	1980,84-2002	1985-2002	1980,85-2002	1996		1980-2002
acute care occupancy rate % of available beds	1980,84-2002	1995-2002	1980,85-2002	1995-96		1981-2002
nursing and elderly home beds per 100 000 inhabitants						1996-2002
MRI (and CT scanners) per million inhabitants	1990-97	1994-2002				1995-96,2001-02
(MRI and) **CT** scanners per million inhabitants	1980-97	1980-2002				1989-90,93-2002
dialyses per 100 000 inhabitants		1994-2002				1995-2002

Table 4. Continued

Variable	Countries: Poland	Slovakia	Slovenia	Bulgaria	Romania	Turkey
HEALTH CARE SYSTEM						
Organisational structure						
Health care system (public contract, public integrated, mixed)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Gatekeeper to non-acute hospital treatment or specialist	1990-2003	1994-2003	1992-2003	1980-2003	1994-2003	1980-2003
Free choice GP or family doctor	1990-2003	1993-2003	1992-2003	1980-2003	1980-2003	1980-2003
Free choice of specialists	1990-2003	1993-2003	1992-2003	1980-2003	1980-2003	1980-2003
Free choice of hospitals	1990-2003	1993-2003	1992-2003	1980-2003	1980-2003	1980-2003
Free choice of dentists	1990-2003	1993-2003	1992-2003	1980-2003	1980-2003	1980-2003
Waiting lists for specialist care	1980-2003	1993-2003	1992-2003	1992-2003	1980-2003	1980-2003
waiting lists for surgeries in hospitals	1980-2003	1993-2003	1992-2003	1992-2003	1980-2003	1980-2003
Financing the health care system						
Population covered by public health system % of total population		1994-2002				1980-90,93-97
Multiple or single source financing system	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
population covered by privates health insurance	1990-2003	1993-2003	1993-2003	1999-2003	1998-2003	1980-2003
Co-payment in connection with GP visits	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payment in connection with specialists visits	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payment in connection with hospital admission	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co-payments in connection with dentist care	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Co.payments for pharmaceuticals	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of hospitals (global budget, fee-for-service, per diem, per discharge)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of physicians in hospitals (fee-for-service, fixed salary)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of general practitioner (fee-for-service, salary, capitation)	1980-2003	1994-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of specialists (fee-for-service, salary, capitation)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Reimbursement of dentists (fee-for-service, salary, capitation)	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003	1980-2003
Overall ceiling of hospital expenditure		1993-2003	1992-2003		1980-2003	1980-2003
FRAMEWORK CONDITIONS						
Gross domestic product per capita, US$ PPP						
female labour force participation (18-65?)						
unemployment rate in % of labor force	1990-2001	1990-2002	1980,82,84-2001	1990-2002	1990-2002	1982-2002

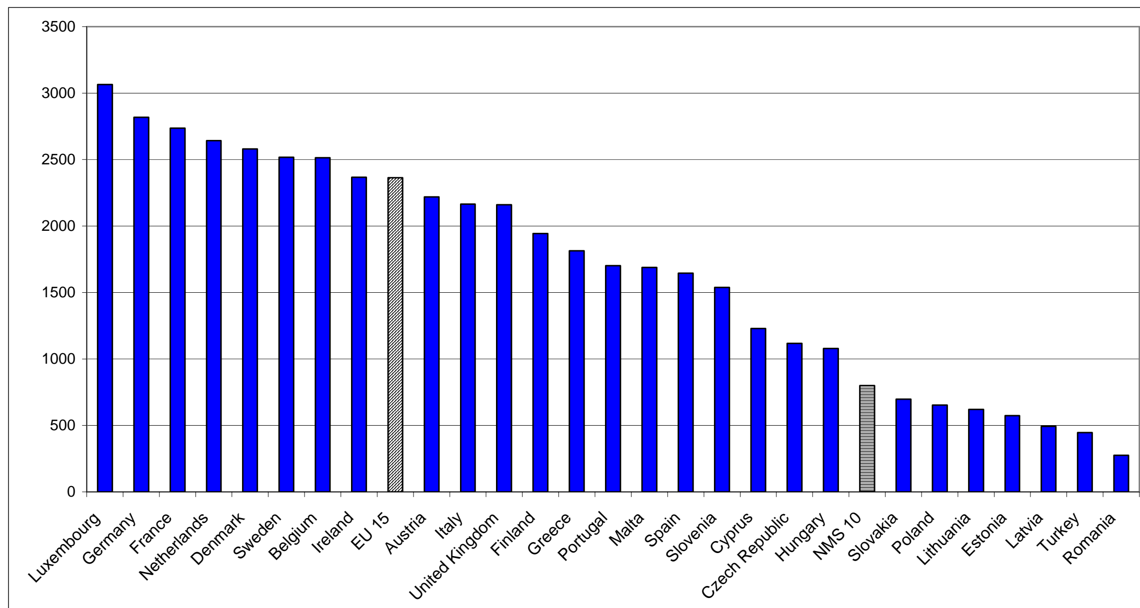
Sources:
EUROSTAT
OECD health Data 2004, Version 1
European health for all database, WHO Regional Office for Europe, Copenhagen, Denmark.
Own created variables based on literatur review

3 Statistical overview

3.1 Health care expenditure

In $US PPP, the EU-15 member states have spent on average $2,400 for health care per capita in 2002, while the new member states have spent only $800 (Figure 2). Across the countries the range of health care expenditure is high. Luxembourg showed the highest amount of health care expenditure per capita (around $3,100), followed by Germany with $2,800, while the candidate countries Turkey and Romania with $450 and $275 respectively showed the lowest expenditure on health care per capita. Thus, the health expenditure per capita in Germany was 10 times that of Romania.

Figure 2. Health care expenditure per capita in 2002 ($US PPP)



Throughout the EU-15 health care expenditure per capita has increased, but the higher end of it has always been realised by Germany and the lower end by Portugal (Figure 3). But in the last four years Luxembourg has overtaken Germany. Health care expenditure increased 6.4 times in Portugal and 3 times in Sweden between 1980 and 2002. The bandwidth across the countries has expanded in the last two decades. In 1980 the health care expenditure per capita in Germany was $560 higher than in Portugal; in 2002 the difference was $1100. Nevertheless, in 1980 Germany spent more than three times the amount on health care as Portugal, but in 2002 this figure had reduced to only 1.6 times.

Germany also spent the highest share of national income (GDP) on health care expenditure – 10.9% in 2002 – while Romania only spent 4.2% (Figure 4). The EU-15 spent on average 9% of GDP on health care in 2002, while the new member states spent 6.4%. The proportion of GDP spent on health care has on average increased in the last decade in the EU-15 (+0.7 percentage points) as well as in the new member states (+0.6 percentage points). The proportion of GDP spent on health care increased in all countries with the exceptions of Finland, Luxembourg, Poland and Lithuania. Finland experienced the greatest decline, of around 2 percentage points between 1992 and 2002. In the 1980s an increase in the share of GDP spent on health care could also be observed in the EU-15 on average, but to a more moderate degree (Figure 5). Since the beginning of the 1990s the development has accelerated. The growth rate in the 1990s was 1.5

times higher than in the 1980s. A strong dynamic can also be observed in the new member states at the beginning of the 1990s, but between 1994 and 2000 the proportion of GDP spent on health care was more or less the same, and in the last two years the share of GDP spent on health care has again increased.

Figure 3. Development of health care expenditure per capita in 1980-2003 in the EU-15 ($US PPP)

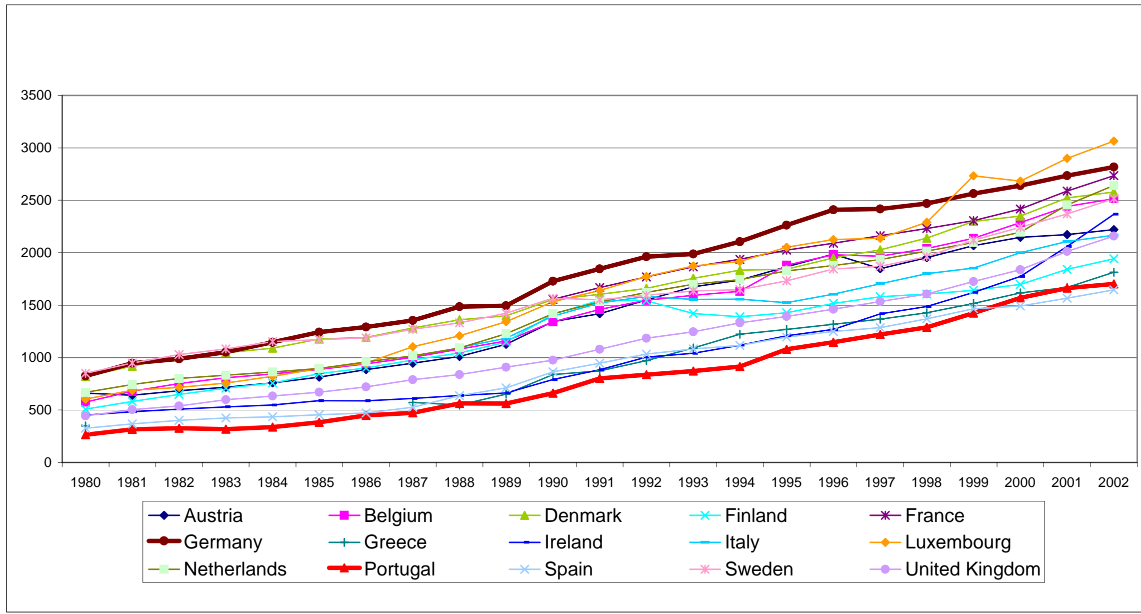


Figure 4. Health care expenditure as a percentage of GDP

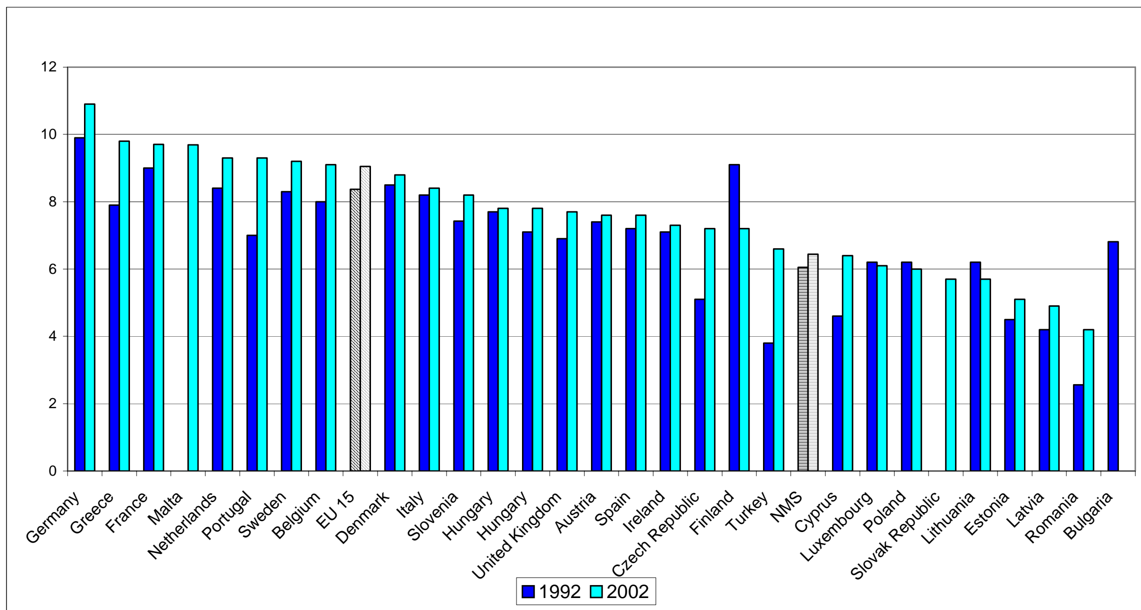
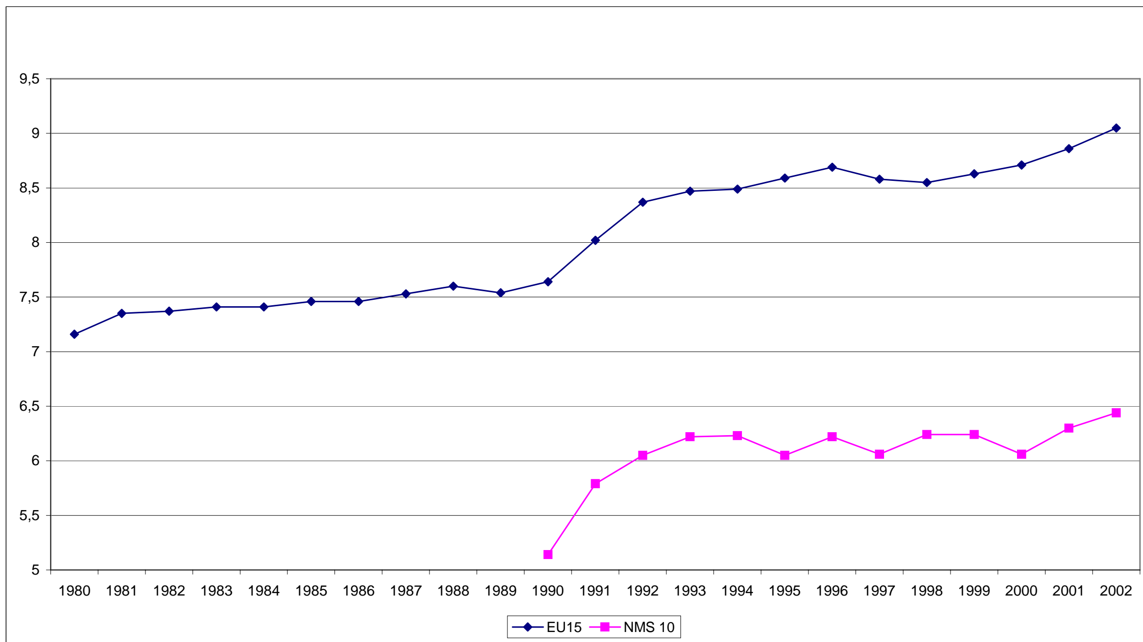


Figure 5. Total expenditure on health as a percentage of GDP



Total health care expenditure in most countries is financed by taxes or contributions to statutory health insurance schemes (or both). Therefore, a large proportion of health expenditure is publicly financed. Privately financed health care includes out-of-pocket payments (fees for consultations, co-payments for pharmaceuticals, dental products [prostheses], orthopaedic aid, self-paid pharmaceuticals, etc.) and contributions to private health insurance schemes. The share of publicly financed health expenditure in 2002 ranged from 100% in Romania to 37% in Cyprus (Figure 6). A traditionally high proportion of publicly financed health expenditure exists in the Nordic countries (Denmark, Finland and Sweden), but also in Luxembourg and the UK. The share of publicly financed health expenditure was over 80% in these countries (with the exception of Finland) in 2002. The share of publicly financed health expenditure has decreased during the last two decades in all of the EU-15 countries with the exception of Portugal. The latter shows an increase of around 6 percentage points between 1980 and 2002 (Figure 7). The new member states generally experienced a change in the political system from a Soviet to a market model, and thus a change in their health care infrastructures and financing. In the Soviet model health care was tax-financed without co-payments. In the 1990s, statutory health care insurance schemes were introduced and as well as co-payments. Therefore, the share of publicly financed health expenditure decreased. In 2002, Latvia in particular showed a marked decline in publicly financed health care from 88% in 1996 to 68% in 2002.

Figure 6. Public health expenditure as a share of total health expenditure (2002)

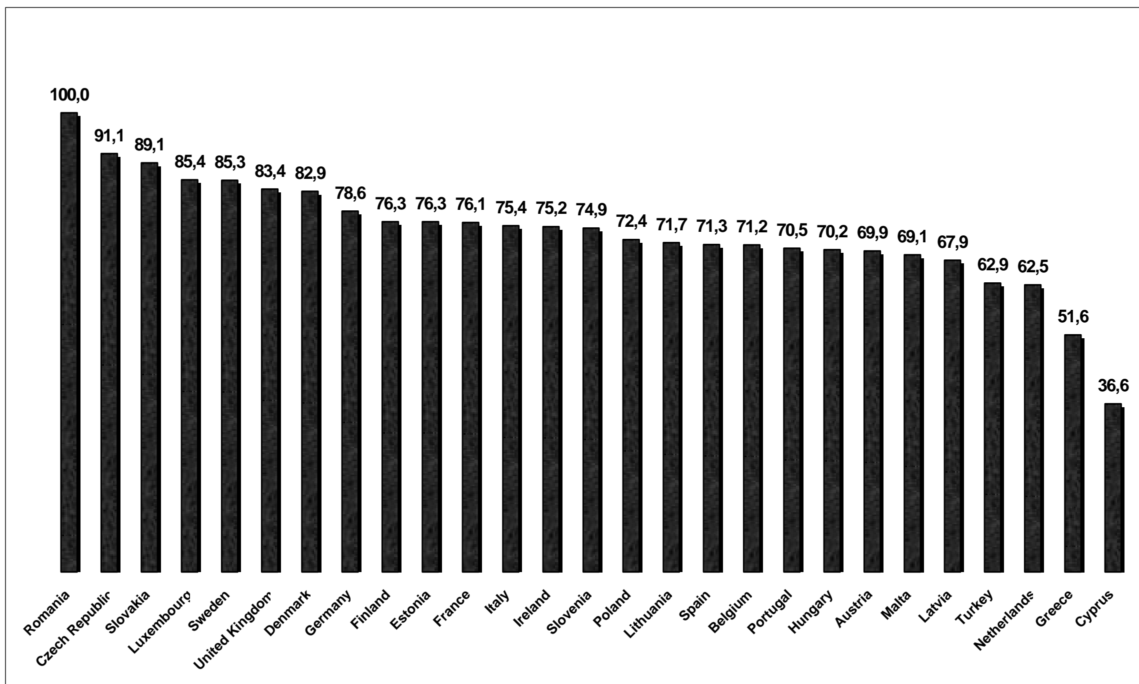
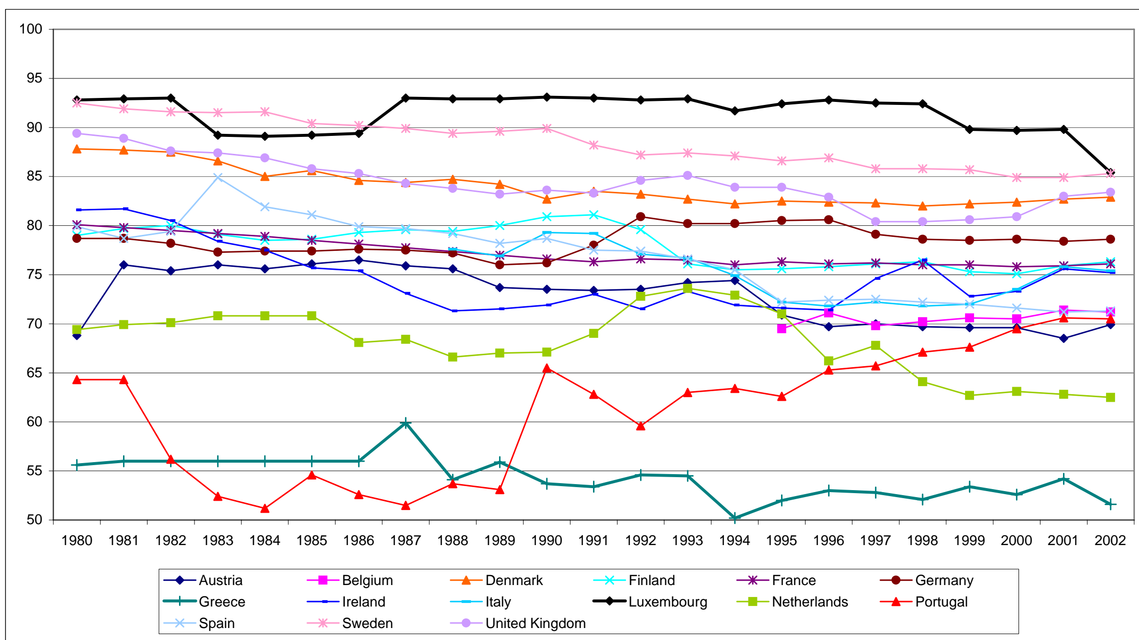


Figure 7. Development of public finance in total health expenditure in the EU-15



3.2 Demography and behaviour

The use of health care services is influenced by the number of inhabitants, but also by the age structure of the population. As previously mentioned, health care expenditure for the elderly is

two to four times higher than that for persons aged 0-64 (see Table 1). Therefore, the proportion of the elderly was included in the data set. In 2001 the proportion of persons aged 65+ in the total population of the EU-15 was 16.3%, in the new member states it was 13.1% and in the three candidate countries (CC-3) it stood at 14.2%, in which the share of persons aged 85+ in the EU-15 was twice as much as in the new member states and the CC-3 (Whereas in general an increase in the proportion of the elderly could be observed in the last two decades, a steady growth cannot be shown in the single age groups in the EU-15 (Figure 9). The share of persons aged 65-74 decreased in the first years of the 1980s, followed by a phase of slow increase. The rising trend sped up in the beginning of the 1990s, and in the last years of the decade there was nearly no change at all. The share of persons aged 75-84 showed a decreasing trend at the beginning of the 1990s, while the share of the oldest old (85+) showed a steady increase.

The development was different across the countries (

Figure *10).* In the 1980s Sweden had the highest proportion of persons aged 65-74 in the total population, but it was replaced by Greece in the mid-1990s. Poland showed the lowest share of persons aged 65-74 in the 1980s, which was overtaken by Ireland at the beginning of the 1990s. Over the last 20 years some countries have shown a decrease (for example Austria, Sweden, Denmark and the Czech Republic), while others a significant increase in the proportion of persons aged 65-74 (for example Greece, Portugal and Spain).

Figure 8). The highest share of persons aged 65+ was revealed to be in Italy, with 18.3% in 2001, followed by Sweden (17.2%). Turkey had the lowest share of elderly persons with 6%.

Whereas in general an increase in the proportion of the elderly could be observed in the last two decades, a steady growth cannot be shown in the single age groups in the EU-15 (Figure 9). The share of persons aged 65-74 decreased in the first years of the 1980s, followed by a phase of slow increase. The rising trend sped up in the beginning of the 1990s, and in the last years of the decade there was nearly no change at all. The share of persons aged 75-84 showed a decreasing trend at the beginning of the 1990s, while the share of the oldest old (85+) showed a steady increase.

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Figure 8. Proportion of the elderly in the total population (2001)

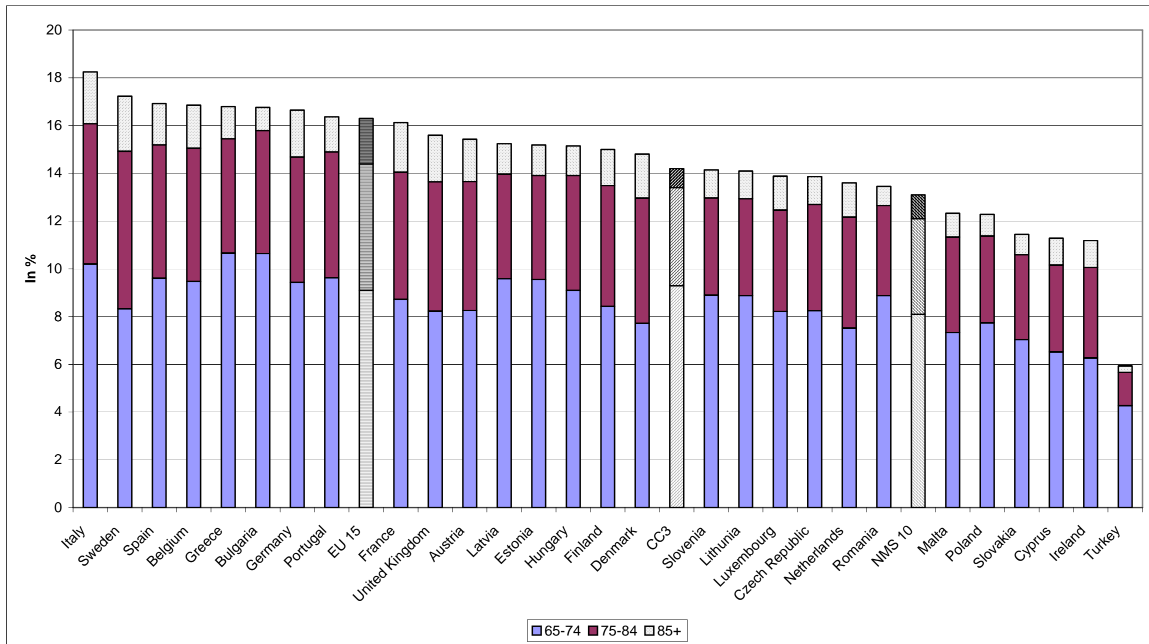


Figure 9. Proportion of the elderly in the total population of the EU-15

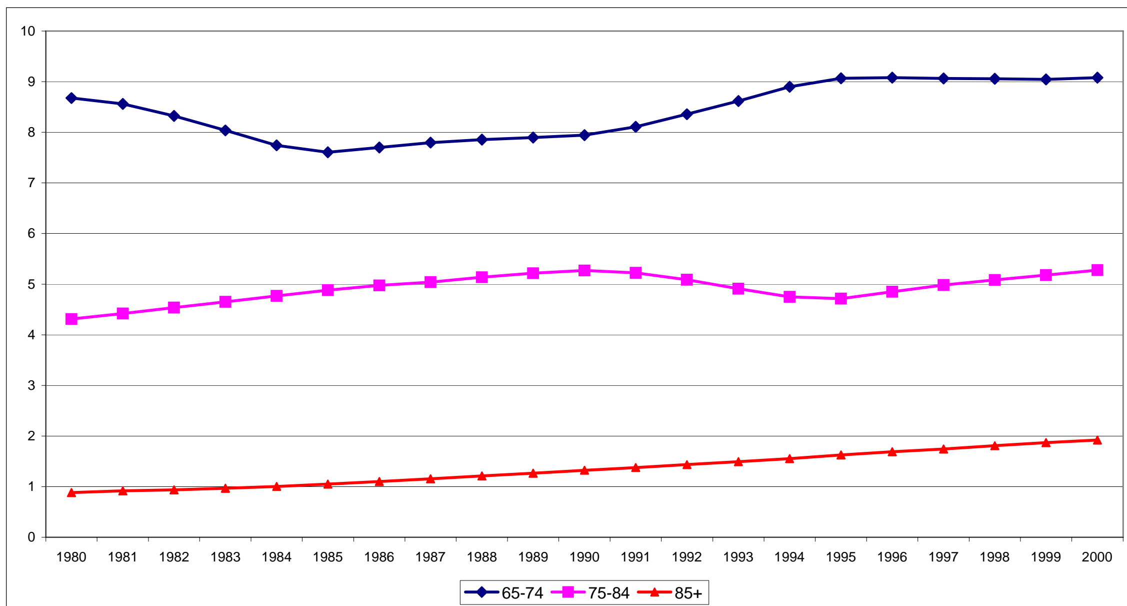
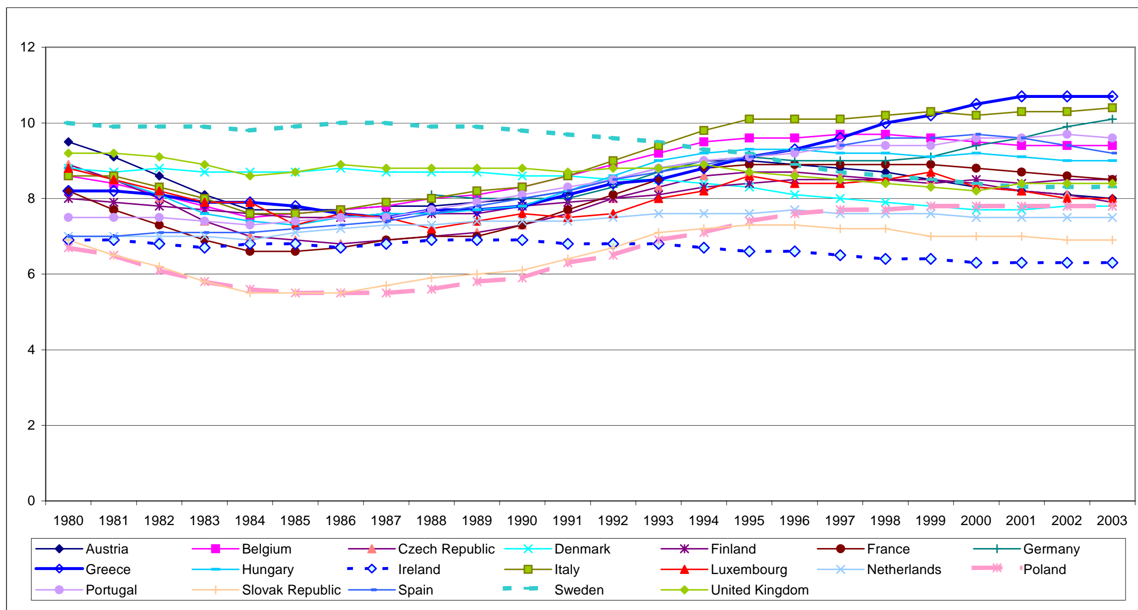


Figure 10. Proportion of persons aged 65-74 in the total population



All countries have shown an increase in the proportion of persons aged 75+ over the last 20 years (Figure 11). The highest increase can be observed for Italy (4 percentage points between 1980 and 2003), followed by Spain (3.7 percentage points), while the lowest is shown by Ireland and Luxembourg (1.1 percentage points each). But over the total period Sweden showed the highest share of persons aged 75+ and Slovakia and Poland the lowest. The increasing share of the elderly is not only influenced by the growing life expectancy at age 65, but also by changes in the fertility rate. Figure 12 presents the relation between changes in the proportion of persons aged 65 and changes in life expectancy at age 65. In all countries the changes in life expectancy and those in the proportion of the elderly show the same positive sign (with the exception of Austria); nevertheless, there are great differences across countries.

Figure 11. Proportion of persons aged 75+ in the total population

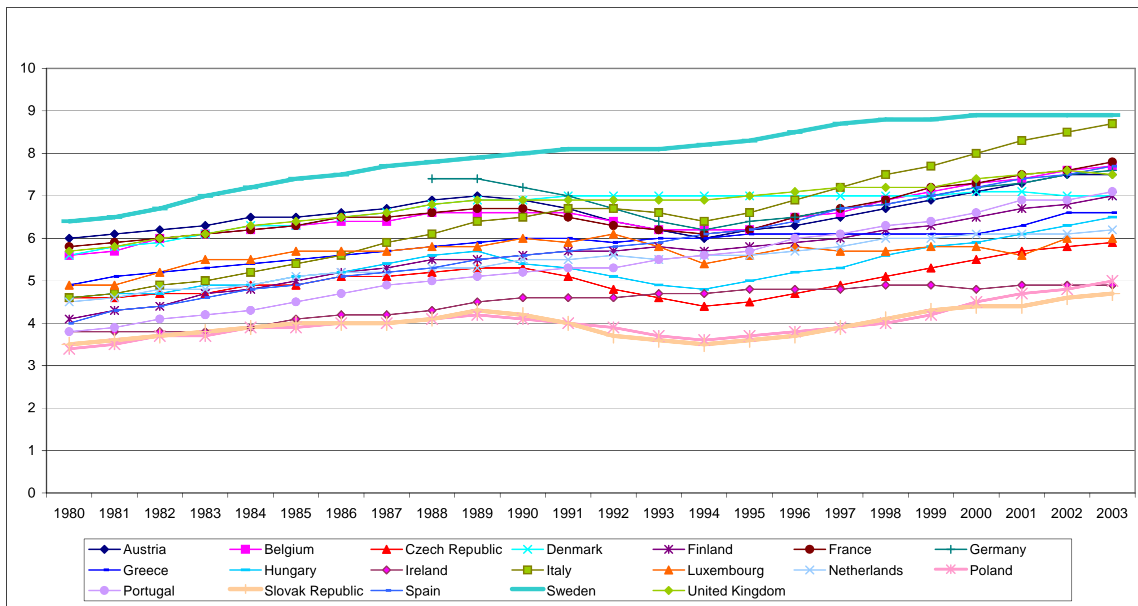
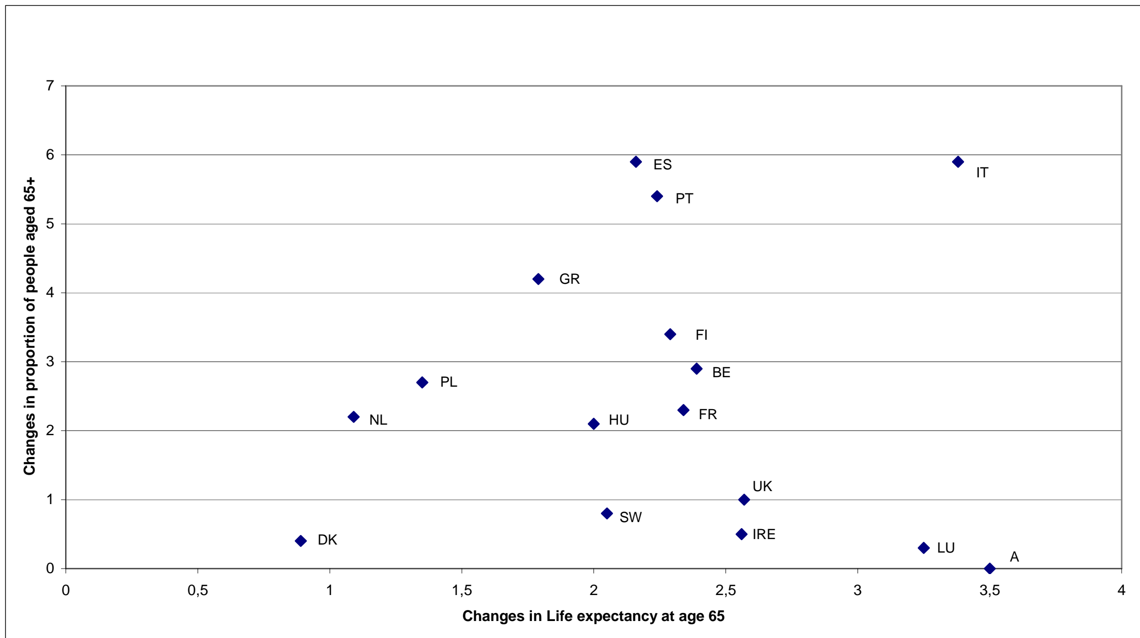
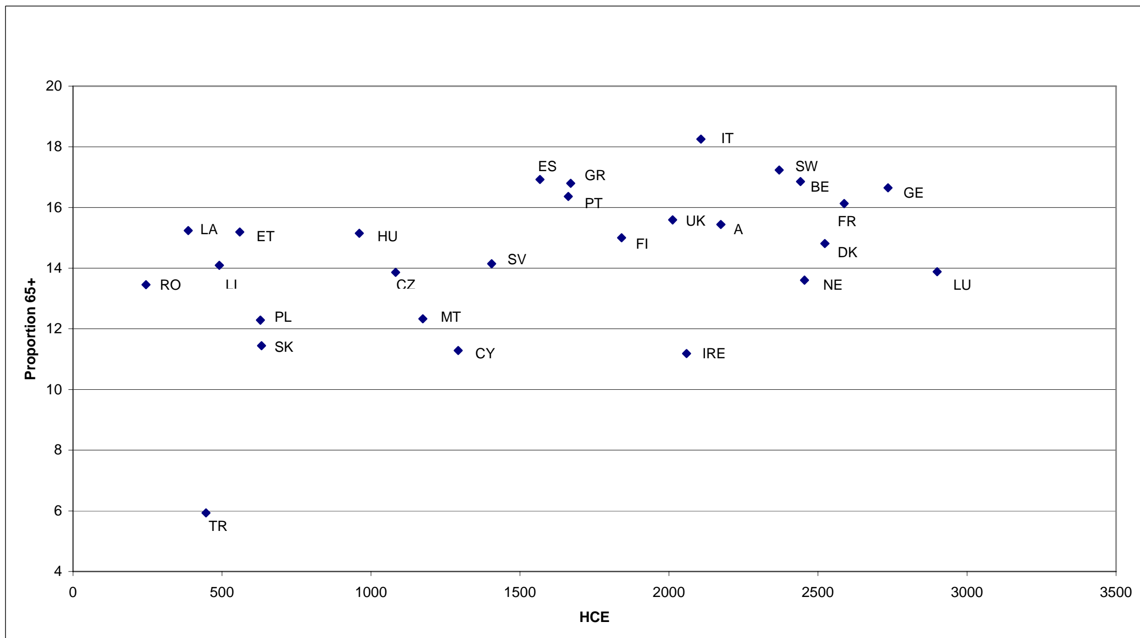


Figure 12. Changes in life expectancy at age 65 and changes in the share of persons aged 65+ between 1980 and 2003



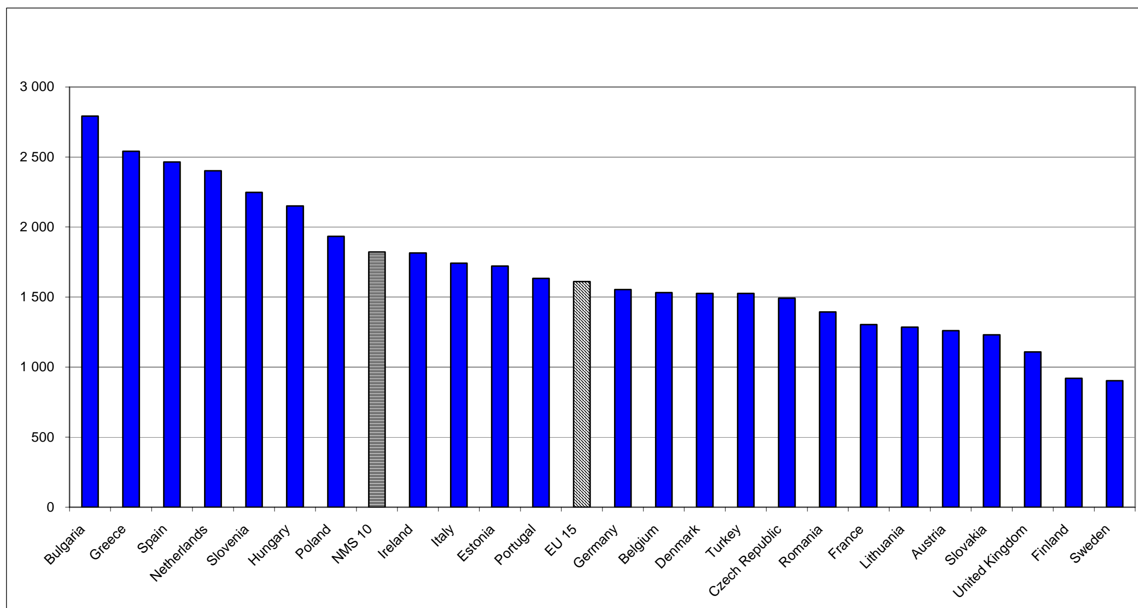
It is expected that the health care expenditure per capita is positively correlated with the proportion of the elderly in the population. A cross-section analysis shows a positive trend in general, but with a great interval (Figure 13).

Figure 13. Health care expenditure per capita and share of persons aged 65+ in 2001



Alongside the demographic variables the behaviour of the population has an impact on the use of health care services. Two behavioural factors were analysed: alcohol consumption and tobacco consumption. The European region has 15% of the world's population, but nearly 33% of the worldwide burden of tobacco-related diseases (WHO, 2004). The annual number of mortalities in the region attributable to the consumption of tobacco products was recently estimated to be 1.2 million. About half of the mortalities affect persons in middle age. Therefore, a high proportion of persons who smoke in the population may lead to higher health care expenditures. In the EU-15, cigarette consumption per person was on average 1,610 cigarettes per year in 2000, while in the new member states the figure was higher at 1,820 cigarettes per person per year (Figure 14). Bulgaria showed the highest level of consumption at around 2,800, followed by Greece with 2,540 cigarettes. The Nordic countries Finland and Sweden showed the lowest consumption at around 900 cigarettes.

Figure 14. Number of cigarettes consumed per person per year (2000)



Alcohol abuse is an important public health problem. Regular drinking of more than small amounts cause or aggravate health problems and increases the risks of injury to the drinker and others (European Commission, 2003). Therefore, high levels of alcohol consumption among the population may have an increasing impact on health expenditure. Adults consumed 11.4 litres of pure alcohol on average in the EU-15 in 2002 (Figure 15). In the new member states the pure alcohol consumption was slightly less at 10.5 litres per capita. Luxembourg showed the highest level of alcohol consumption, 17.2 litres, which is one and a half times the EU average. On the other end of the scale, Turkey showed the lowest level of alcohol consumption at 1.5 litres. The high level of alcohol consumption in Luxembourg is notable. It can be traced back to heavy drinking/high levels of alcohol consumption on the part of visitors and tourists. Österberg & Karlsson (1998) reported large numbers of visitors buying alcohol in Luxembourg. They cite a study from Hurst et al. (1997) in which 70 to 75% of all sales of distilled spirits was estimated to have been purchased by visitors in Luxembourg. But drinking behaviour may also affect the figure for Luxembourg. The WHO reported that mortality from liver cirrhosis in Luxembourg is 30% higher than the EU average. Luxembourg's mortality rate from alcohol-related causes is

also among the highest after Slovenia and Finland, among both men and women, suggesting harmful drinking patterns in Luxembourg (WHO, 2005).

Another interesting indicator for demand-driven health care expenditure may be the self-reported health status of a population, but information is scare. The OECD health data provide some information, but data are not available as a long time series and not for all countries. For example, the collected data for 2002 are shown in Figure 16. The proportion of persons reporting to be in good health is highest in Luxembourg with 91% and lowest in Slovakia with 35%. The figure for Luxembourg is astonishing in view of the high level of alcohol consumption mentioned above.

Figure 15. Pure alcohol consumption in litres per capita of the population aged 15+ (2002)

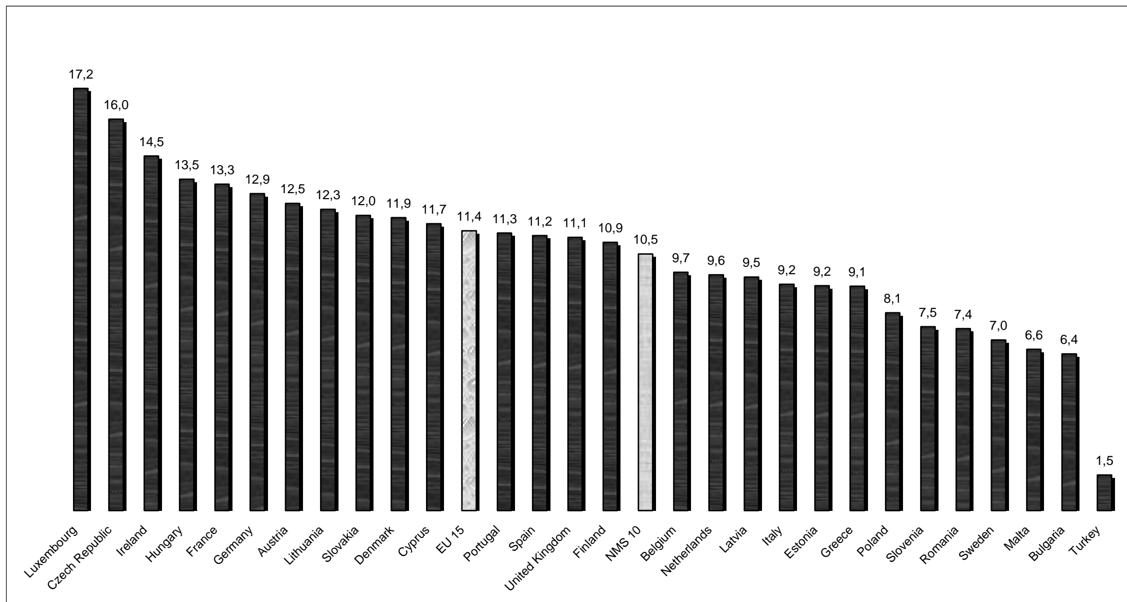
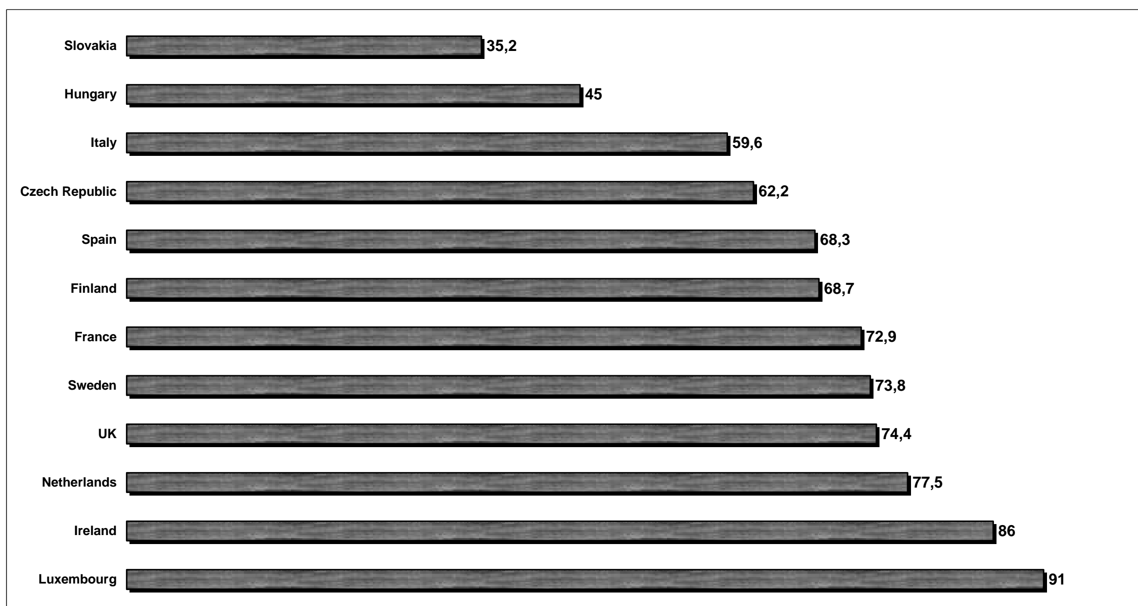


Figure 16. Proportion of the population in good health (2002)



3.3 Physicians and technical equipment

The allocation of health care services is not costless and therefore supply factors are also drivers of health care expenditure. Such factors include the number of employees in the health care sector and the technological equipment in ambulatory and hospital care, but also the availability and accessibility of health care resources (number of hospitals and hospital beds, number of health care centres, number of medical practices and number of pharmacies). Supply and demand factors (or utilisation) are not independent. A high density of health care services induces high utilisation rates, while waiting lists for elective surgery, for example, are a limiting factor for utilisation. Some indicators have been included in the data set and are described below.

In the EU-15, there were 3.6 practising physicians per 1,000 inhabitants in 2002, while in the new member states there were only 2.8 (Figure 17). The highest density was in Italy, with 6.2 physicians per 1,000 inhabitants, followed by Greece with 4.5. The candidate countries Romania and Turkey had the lowest density with respectively 1.9 and 1.3 physicians per 1,000 inhabitants in 2002. In the last two decades the density of physicians increased in all the EU-15 countries (Figure 18). Among the EU-15, Italy had the highest density over the last two decades, while the UK had the lowest density in all years. Nevertheless, all the countries realised the same increasing trend during this period. Among the new member states and the three candidate countries, however, the development has been different in the last 20 years: some countries showed an increasing trend, while others the opposite. Latvia had the highest density in the 1980s, but at the beginning of the 1990s there was a marked decrease. This development could be traced back to the changes in its political and economic situation. Lithuania replaced Latvia in terms of physician density in the 1990s. Turkey had the lowest density during the whole period, but also experienced an overall increase in density (Figure 19).

Figure 17. Practising physicians per 1,000 inhabitants (2002)

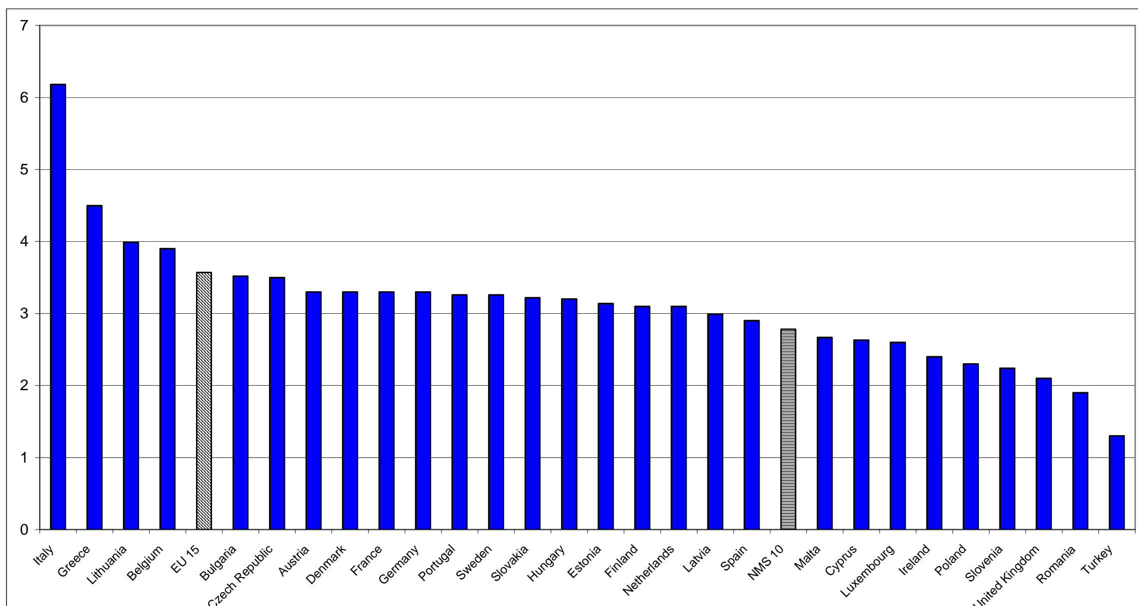


Figure 18. Practising physicians per 1,000 inhabitants in the EU-15

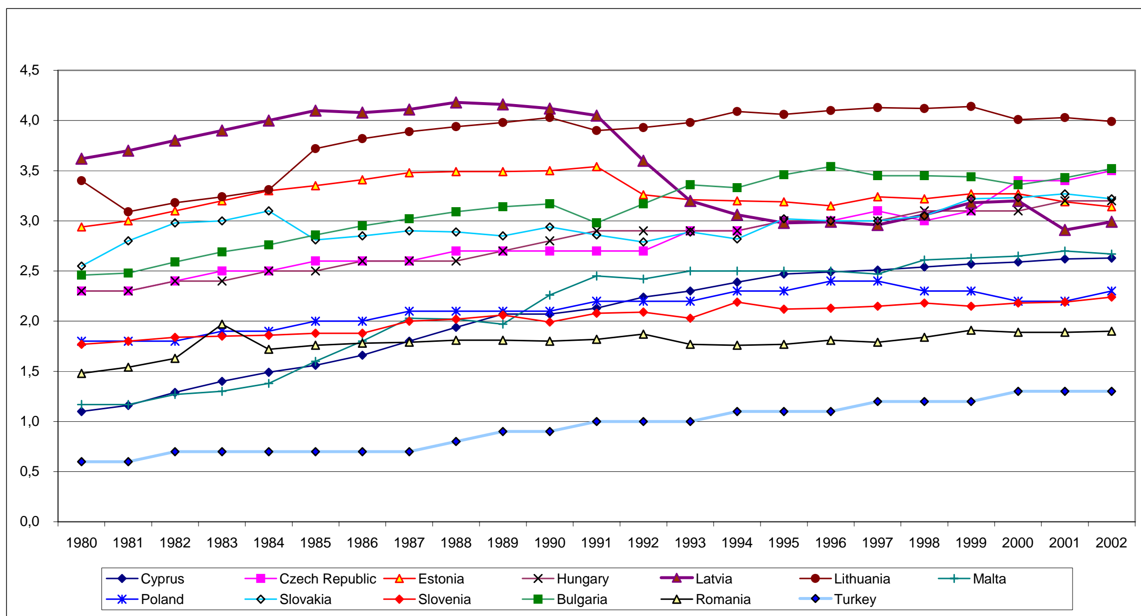
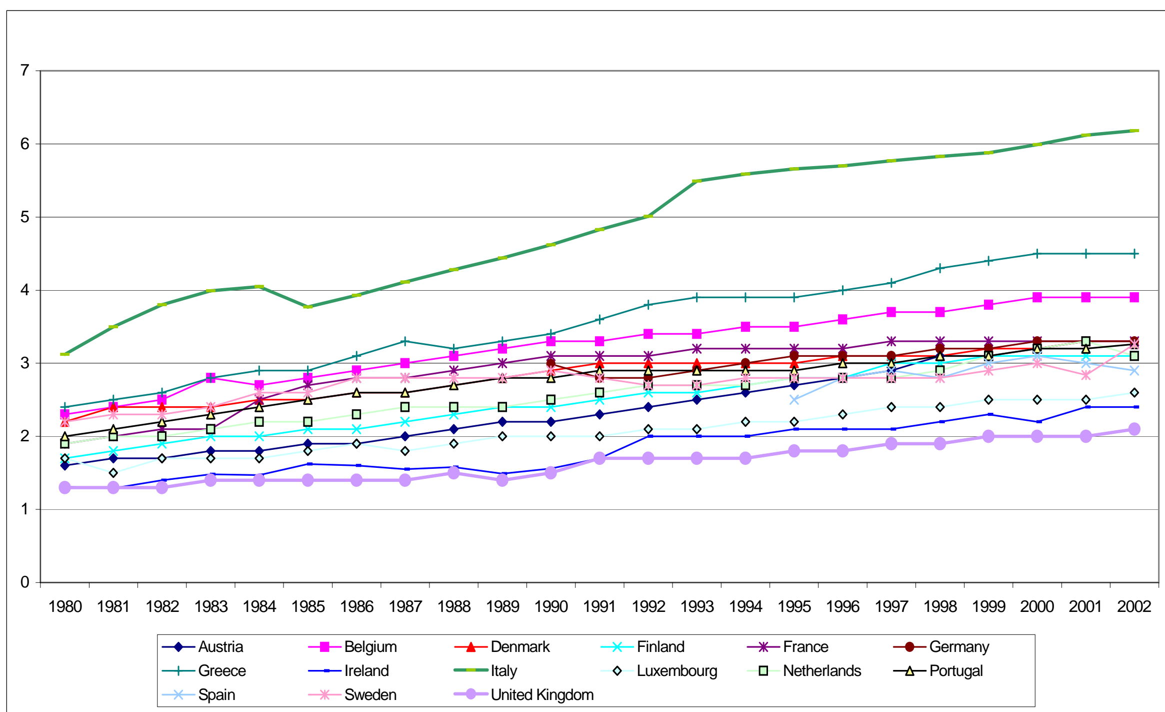


Figure 19. Practising physicians per 1,000 inhabitants in the new member states and the CC-3



Another indicator on the supply side is the number of acute-care beds per 1,000 inhabitants. In the new member states the number of beds in 2002 was on average more than 5 beds per 1,000 inhabitants higher than in the EU-15 (4 beds per 1,000 inhabitants), but there were great differences among the countries in the density of acute-care beds (Figure 20). People in

Slovakia were in a favourable situation with around 7 beds per 1,000 inhabitants, while those in Turkey were in a less favourable situation with only around 2 beds. Over the period 1980 to 2002 a more or less decreasing trend can be observed for all EU-15 member states, with the highest density in Germany and the lowest in the UK (Figure 21). In 1995 the supply of acute care beds in the UK increased markedly, and since 1995 Sweden has shown the lowest number of acute care beds per 1,000 inhabitants. A decreasing trend in the last 20 years can be observed in the new member states and the three candidate countries as well. The exception to this development has been Turkey, which has shown an increase overall, but this rise comes from a very low initial level (Figure 22).

Figure 20. Acute care beds per 1,000 inhabitants in 2002

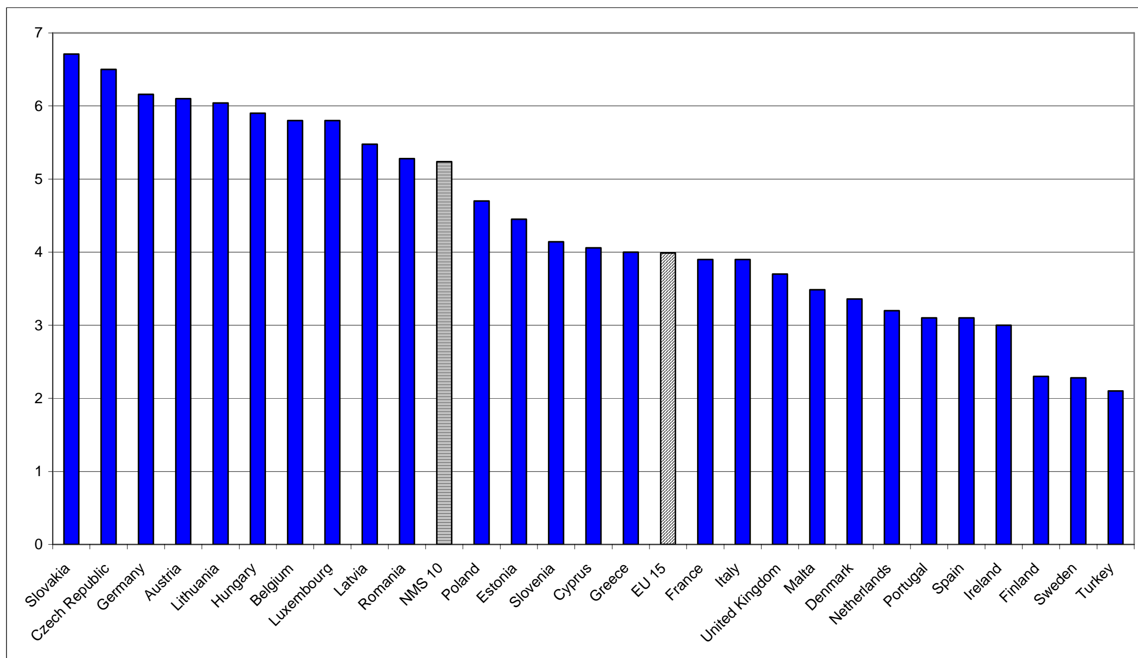


Figure 21. Acute care beds per 1,000 inhabitants in the EU-15

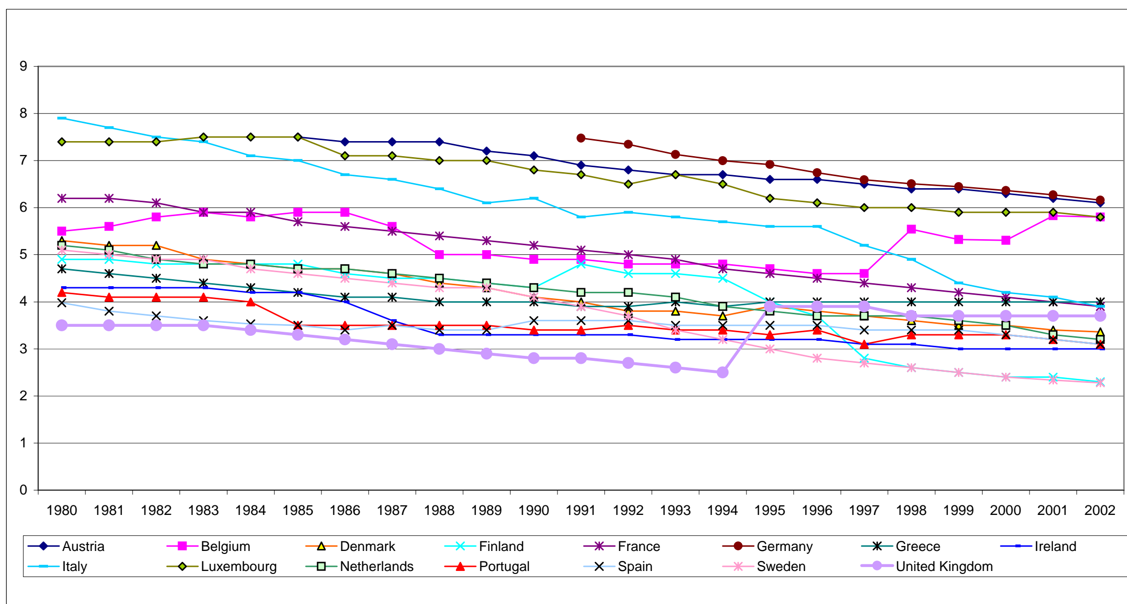
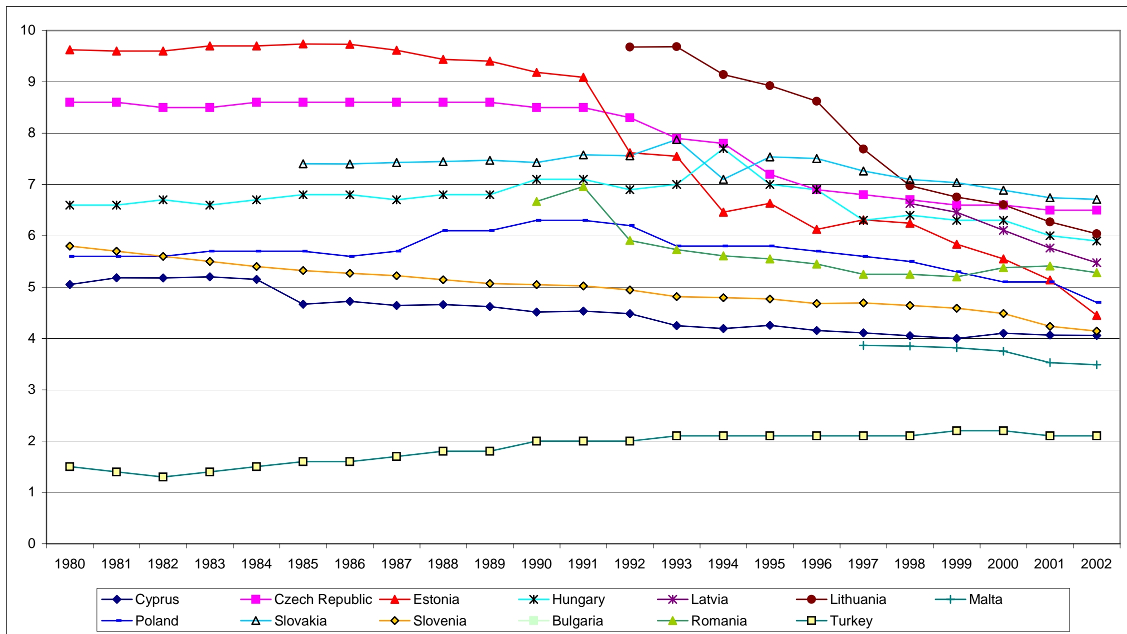
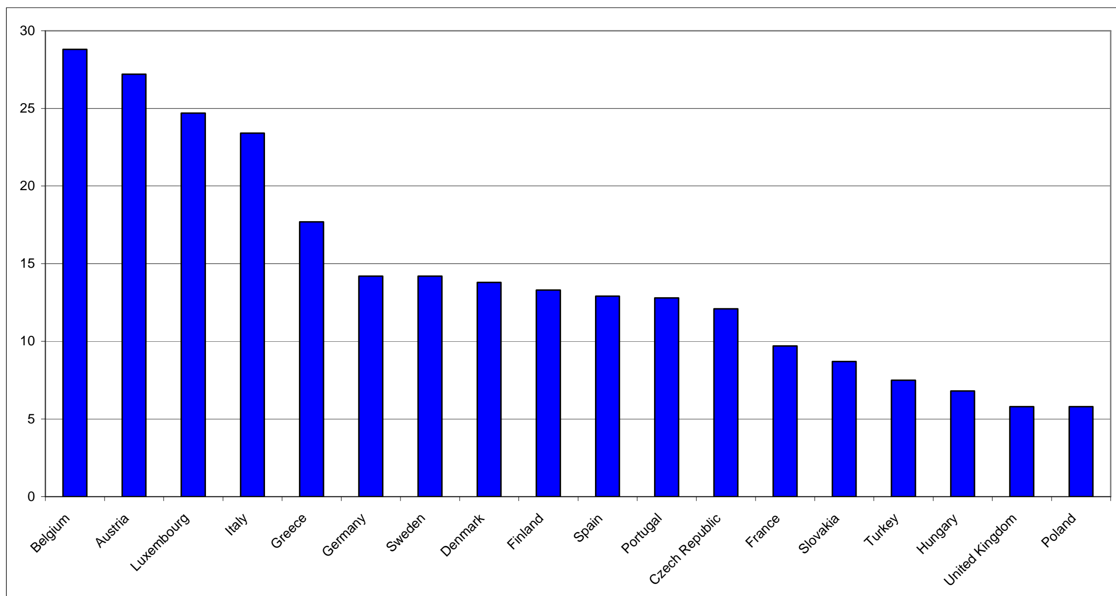


Figure 22. Acute care beds per 1,000 inhabitants in the new member states and the CC-3



Information about the supply of technical equipment is not available for all countries or for all years. For example, the computed tomography (CT) scanners per million of the population in 2002 is shown in Figure 23. Belgium had the highest number of CT scanners with around 30 per million inhabitants, followed by Austria. The CT facilities were lowest in Hungary, the UK and Poland (with around 7 or 6 units per million inhabitants respectively).

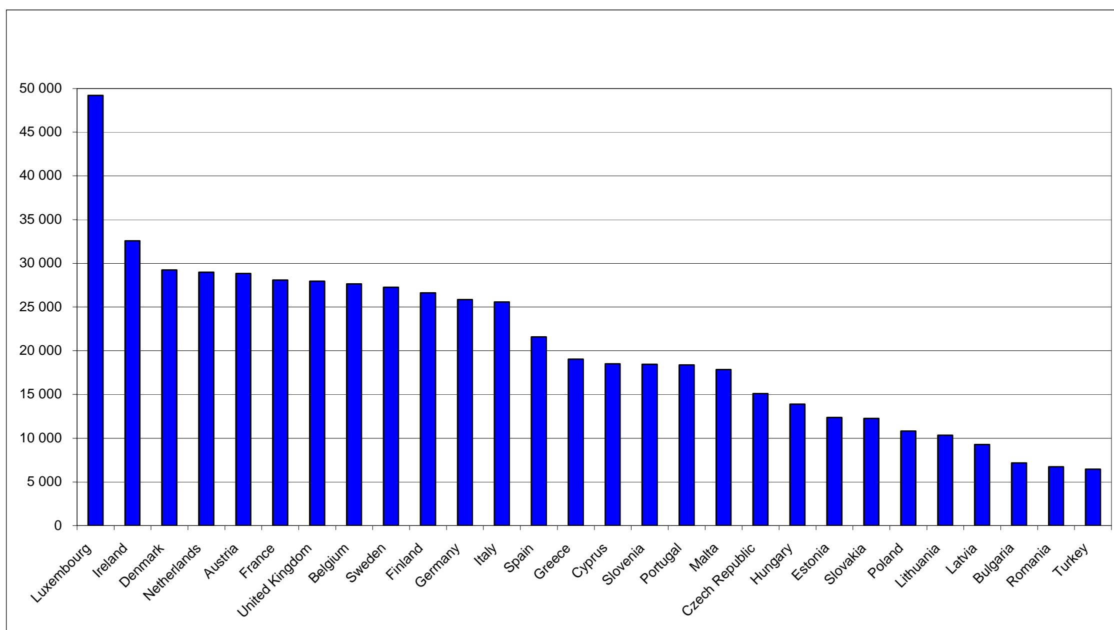
Figure 23. CT scanners per million of the population (2002)



3.4 Economic situation

The economic situation is one of the famous determinants of health care expenditure. High economic growth rates facilitate the expansion of health care services, the reduction of waiting list for elective surgeries and the purchase of new technical equipment. One indicator of the economic situation is the GDP per capita. In 2002 there was a wide spectrum of GDP per capita among the EU countries and the candidate countries (Figure 24). The GDP per capita in Luxembourg, at nearly $50,000 (PPP), was significantly higher than in other EU countries, followed at a far distance by Ireland, having $33,000 (PPP). The lowest GDP per capita was had seen in the three candidate countries Bulgaria ($7,200 PPP), Romania ($6,700 PPP) and Turkey ($6,500 PPP).

Figure 24. GDP per capita in 2002 ($US PPP)



It is expected that health care expenditure and GDP are positively correlated. The relationship between GDP and health care expenditure can be shown by comparing the parameter values in EU countries. In 2002 a high positive correlation can be observed (Figure 25).

Another indicator of the economic situation is the unemployment rate. Poland (at 20%), Slovakia (at 19%) and Bulgaria (at 18%) showed high unemployment rates in 2002 (Figure 26). But perhaps the unemployment figures are overestimated (especially among the younger age groups) to the extent that only *official employment* is considered in the statistics. Low unemployment rates can be seen in Luxembourg (1.7%) and the Netherlands (2.6%).

Figure 25. Health care expenditure and GDP per capita (2002)

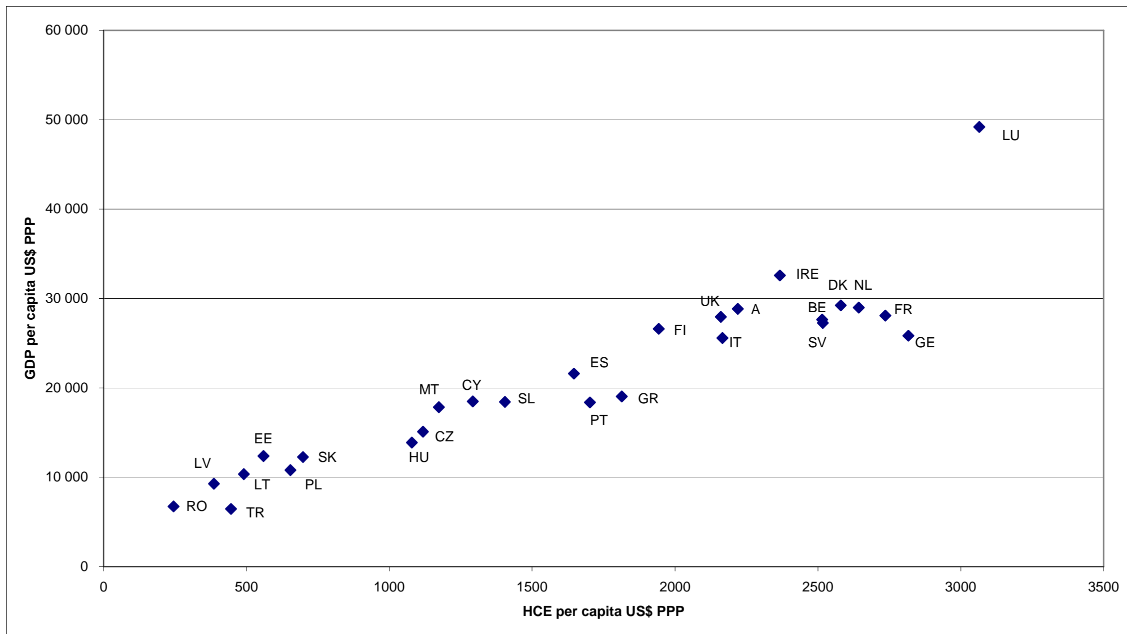
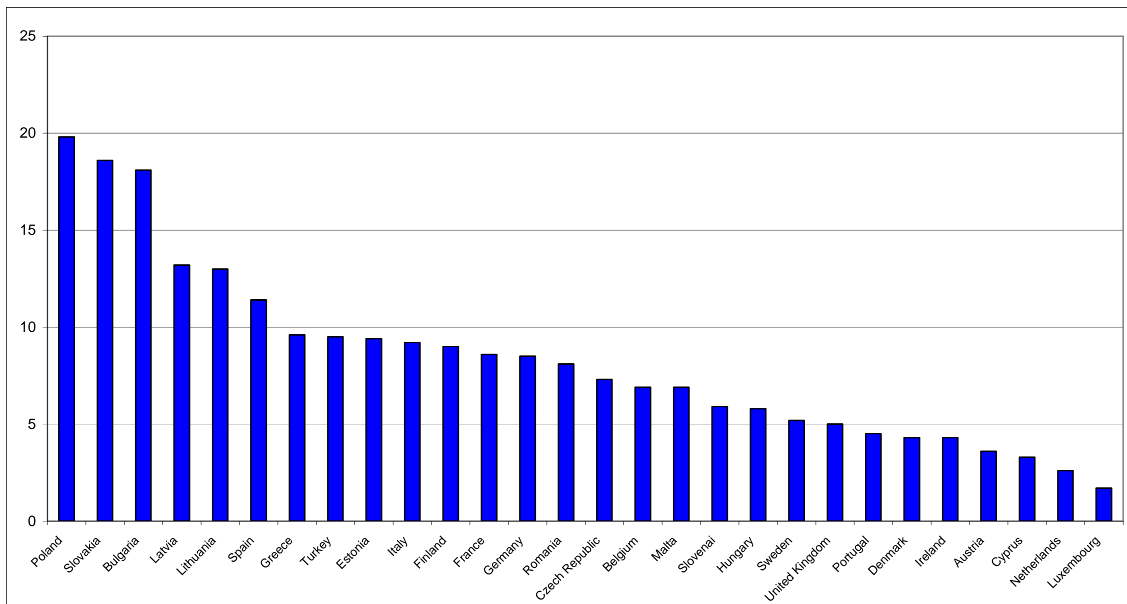


Figure 26. Unemployment rate (2002)



3.5 Health care systems

Variables describing the health care and financing systems are author-created variables based on a review of the literature. The information mostly originates from the HiT reports referred to earlier. Countries are classified into three health care system categories: public integrated, public contract and mixed systems or systems in transition. In 2003, the following countries

were classified as public integrated systems: Denmark, Finland, Ireland, Italy, Spain, Sweden, the UK, Latvia and Malta. Classified as public contract systems were: Austria, Belgium, Germany, Luxembourg, the Netherlands, the Czech Republic, Estonia, Poland, Slovakia and Slovenia. All other countries were classified as mixed systems or systems in transition (Table 5). Public integrated systems are mostly financed by taxation, but among these only a few countries solely derive their finance through taxation (Denmark, Ireland, Italy, Spain, Latvia and Malta). Nevertheless, out-of-pocket payments (co-payments and/or private insurance) also exist in these countries.

In several countries co-payments for visits to a GP, a specialist or a dentist, or for a hospital stay or pharmaceuticals are common. The co-payment system is complex in most countries and fees have changed over time. There was no co-payment system in place for visiting a GP in Germany, Greece, Italy, the Netherlands, Spain, the UK, the Czech Republic, Hungary, Lithuania or Malta in 2003. In 2004, however, the situation in Germany changed, whereby patients now have to pay €10 per quarter for visiting a practitioner. Generally, in 2003 there were no co-payments for hospital stays in Denmark, Greece, Italy, the Netherlands, Portugal, Spain, the UK, the Czech Republic, Estonia, Hungary, Lithuania, Malta, Poland, Slovakia, Romania or Turkey, but charges were common for extra services (a single room, telephone, etc.). In all countries there were co-payments for pharmaceuticals with the exception of Malta.

Table 5. Classification of health care systems (2003)

Public integrated	Public contract	mixed or in transition
Denmark	Austria	France
Finland	Belgium	Greece
Ireland	Germany	Portugal
Italy	Luxembourg	Cyprus
Spain	Netherlands	Hungary
Sweden	Czech Republic	Lithuania
United Kingdom	Estonia	Bulgaria
Latvia	Poland	Romania
Malta	Slovakia	Turkey
	Slovenia	
Sources: HIT Reports.		

Another indicator differentiating the health care system is the existence of a gatekeeper. It is expected that if a GP or family doctor acts as a gatekeeper to other health care services (specialists, hospitals, MTR diagnoses, etc.) the incentives for extensive health care utilisation will be limited (through the prevention of duplicate examinations, for example). A gatekeeper system was present in 20 out of 28 countries in 2003: Austria, Denmark, Finland, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden, the UK, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, Bulgaria and Romania.

The reimbursement of hospitals and physicians is another indicator of the health care system. Hospitals can be reimbursed through a global budget, fees for services, per diem, a case-based (using DRGs) system or a mix of these. In most countries in the past a per diem reimbursement system or a global budget was in place, but in more and more countries case-based reimbursement systems have been introduced in recent years. In Germany, for example, a DRG-based system was introduced in 2003 on voluntary basis, but in 2005 this system became statutory for all hospitals. A global budget was still being used in Ireland, Luxembourg, Spain,

Cyprus, the Czech Republic, Malta and Turkey in 2003. A case-based system was introduced in Austria, Italy, Hungary, Lithuania, Poland, Slovakia and Slovenia.

Physicians can be reimbursed by salary, capitation or fees for services, but in nearly all countries some mix of these systems exists. In 2003, GPs were mainly salaried in Spain and Portugal (along with those GPs in health care centres in Finland), but in 1999 a mix of salary and capitation was introduced in Portugal. GPs were mainly remunerated by capitation in Ireland, Italy, Hungary and Bulgaria, and a fee-for-service remuneration was present in Belgium, France, Germany and Luxembourg in 2003.

Two other indicators describing the health care system are i) the existence of waiting lists for elective surgery, which is an indicator of a gap between demand and health care service supply in this field, and ii) whether patients have a free choice of hospitals. There are waiting lists in several countries, and with respect to long waiting times countries generally tend to tighten measures to reduce the wait. In 2003 countries with waiting lists were Denmark, Finland, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden, the UK, Cyprus, Estonia, Hungary, Latvia (mostly for specialists), Malta and Slovenia. A free choice of hospitals did not exist in Greece, Spain, Cyprus or Malta that year, and in the UK it was the family doctor who chose the hospital. In a number of countries a referral was needed for hospital treatments, which was the case in Germany, Ireland, Italy, Portugal, the Czech Republic, Estonia, Hungary, Latvia, Poland, Slovenia, Bulgaria and Romania.

4 Main findings and conclusions

The aim of WP6 of the AHEAD project is to explain how demand and supply factors influence aggregate health care expenditure with a specific focus on age composition. Several studies in the past have shown that health care expenditure is not only influenced by demand factors, but also by those on the supply side, particularly technological progress, political decisions and economic framework conditions. In contrast with other studies (and aside from the focus on age), WP6 emphasises variables describing health care and financing systems. The idea is that the inclusion of these variables affords a better explanation of health care expenditure.

The first step in verifying this hypothesis involves collecting the required data. Thus the task of Part A of WP6 has been to collect data on demand, supply and utilisation of health care from official statistics and to create additional variables describing the health care and financing systems based on a literature review. In total, 63 variables have been included in a basic data set for 28 countries, mostly covering the period 1980-2003. As information for Cyprus and Malta information was found to be scarce, these countries have had to be deleted from the data set to be used for further analyses. Nevertheless, in the basic data set all available information is incorporated, including that for these two countries.

The development of some of the variables for the countries has been shown in a brief statistical overview. The expected strong connection between health care expenditure and GDP can be seen in a cross-section analysis for 2003. The relation between health care expenditure and the share of elderly persons in the population was also positive, but not as strong as in the case of GDP.

Based on a selection of variables from the basic data set, correlation analyses have been carried out by the Department of Public Health at the University of Southern Denmark (Prof. Christiansen, Prof. Bech and Mr. Nielsen). Their results will be presented in a separate forthcoming paper (Part B of WP6).

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