

I/Spring 1999

HEALTH SYSTEM WATCH

Supplement of the journal *Soziale Sicherheit*

Institute for Advanced Studies (IHS) – IHS HealthEcon

Edited by the Hauptverband der österreichischen

Sozialversicherungsträger (Federation of Austrian Social Security Institutions)



CROSS-SECTION ANALYSIS OF HEALTH SPENDING WITH SPECIAL REGARD TO TRENDS IN AUSTRIA

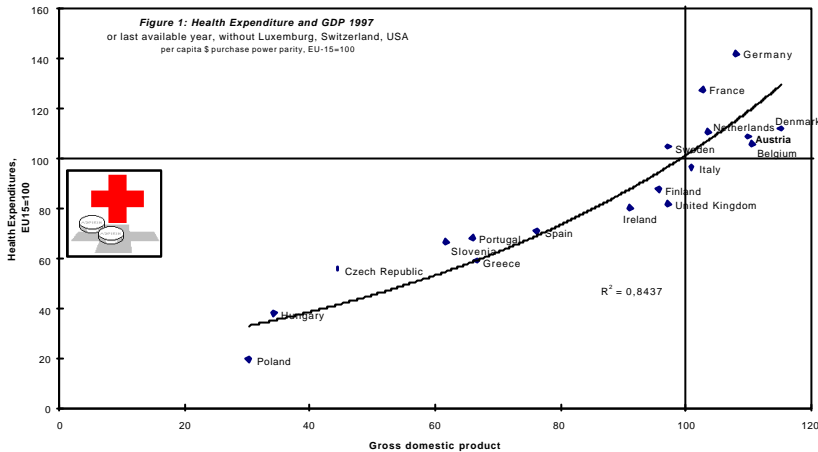
by Maria M. Hofmarcher*

The richer a country, the higher its expenditure on health care. The increase in health spending which compared to the overall growth had taken place at a rather rapid pace experienced a worldwide slow-down during the 90s. In relation to overall economic growth and the expansion of other countries' health care systems, Austria's system grew below average- a fact which holds particularly true for the years between 1990 and 1997. This development may largely be due to a constant consolidation of budget, relatively high prices for private households, which, however, are possibly overestimated and still unascertained but highly probable improvements in productivity in the main fields of health care. Within our observation period of 16 years, the private households' expenditure reached a peak with private health spending experiencing the quickest increase.

Although overestimated, these relatively high prices together with a sharply rising consumption expenditure on health care constitute an increased burden on private households. While social insurance companies in their function as bulk purchasers have had the power to reject excessive prices, private customers were charged above average during the last few years. This development has to be closely scrutinized in order to ensure public welfare and the maintenance of a social health care system in future.

* Special thanks to Monika Riedel, Peter Steiner and Jürgen Schwärzler for contributing to this study.

CROSS-SECTION ANALYSIS



1 THE RICHER A COUNTRY, THE HIGHER ITS EXPENDITURE ON HEALTHCARE

In contrast to a linear correlation, the exponential trend depicted in figure 1 not only proves that the development of health spending interacts with the development of the GDP but also shows that from a certain level of income an increase in earnings is accompanied by a disproportionately sharp rise in expenditure.

Relative to the respective GDP-level health care expenditures in Poland, in Slovenia and in Greece are lower compared to the EU-average. In rich countries, as for example Austria, Belgium, France, Germany, the Netherlands, Switzerland and the USA the amount spend on health care is relative to the respective GDP higher.

In the following chapters we will closely examine the relationship between GDP and health spending and estimate the elasticities¹. For this purpose the

¹ The concept of elasticities gives us the chance to quantify by how many percentage points health spending rises in case the aggregate income increases by one percent. An income elasticity of one indicates that a one-percent increase in income leads to a one-percent rise in spending (constant elasticity). If the elasticity ranges above one, spending is increasing more rapidly than income (which makes health care services appear a luxury). From the beginning of the 70s economists have been engaged in an empirical analysis of the relationship between health spending and aggregate income. To get a better understanding of their various approaches, please see Gerdtham, U.-G. et al.: An econometric analysis of health care expenditures: A cross section study of the OECD-countries, *Journal of Health Economics* 11 (1992), p. 63-

relationship between health care expenditure and aggregate income is depicted by means of a line and the slope of the line is estimated in a cross-section study of all the respective countries². Based on percentage changes in aggregate income, percentage changes in health spending help to understand how distinct income levels affect the level of health care expenditure³.

2 DECELERATED INCREASE IN HEALTH SPENDING

The ratio between the annual growth in GDP per capita and the annual increase in health spending per capita shows that the goods and services of a health care system are "luxury goods". From the middle of the 90s, however, the increase in spending has been slowed down all over the globe but particularly in the EU countries. In 1997 the rise in health care expenditure was slightly lower than the increase in income in those countries which had already qualified for the monetary union

84, North Holland; Mc Gurie, A. et al.: Econometric analysis of National Health expenditures: Can positive economics help to answer normative questions? *Health Economics* 2 (1993), p. 113-126; OECD: Factors affecting health spending: a cross country econometric analysis, Annex A, *New Directions in Health Care Policy, Health Policy Studies* 7, p. 71-88, Paris.

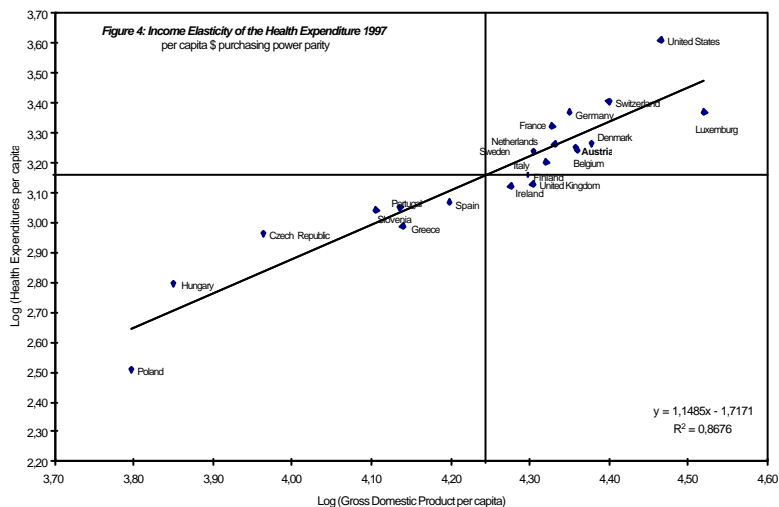
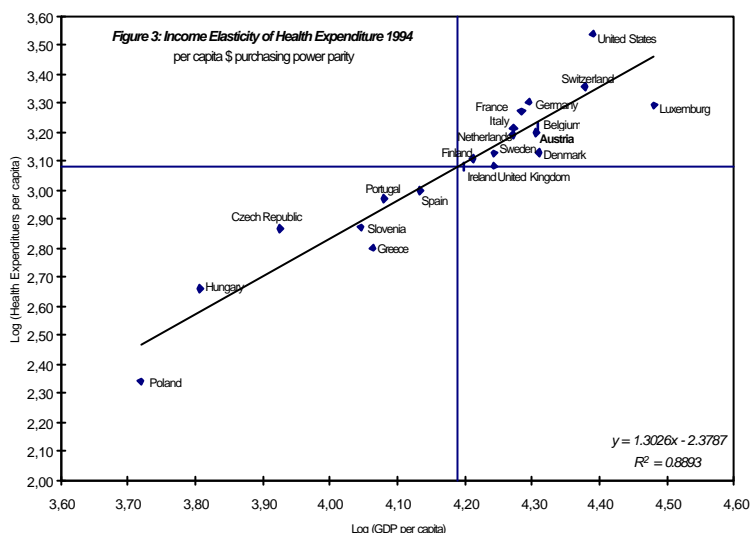
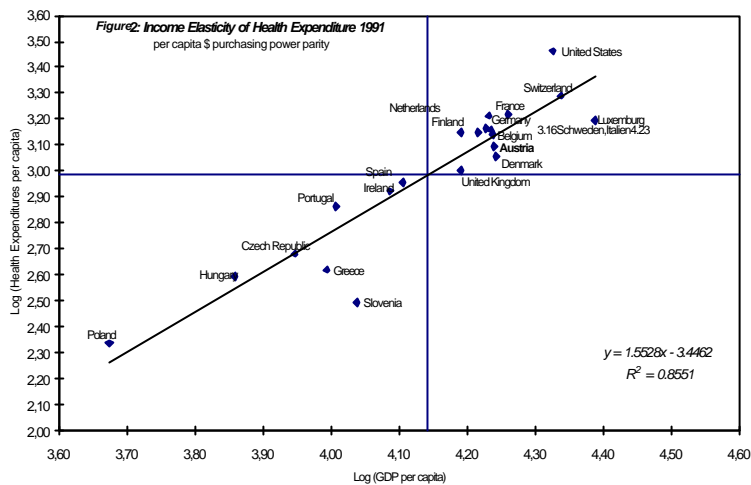
² With regard to new findings that had been made concerning the functional relationship between health spending and GDP (double-logarithmic function), both variables were logarithmed in this analysis. (see further Gerdtham, U.-G. et al. (1992). Even in multiple regressions, the relationship between GDP and health spending turns out to be most pronounced which is why we solely concentrate on this relationship in our study.

³ The following figures also include Luxemburg, Switzerland and the USA.

After adjusting for differences in purchasing power expressed in US dollars, GDP and health spending significantly correlated in 1991, 1994, 1996 and 1997. The slope of the lines depicted in figures 2 to 4 shows the elasticity reflecting the relationship between the increase in health spending per capita and the rise in income per capita. Table 1 summarizes the income elasticities of health spending depicted in figures 2 to 4. Furthermore, the countries concerned were classified into certain groups which revealed that the income elasticity of health spending experienced a worldwide decrease by 25% between 1991 and 1997 and amounted to 1.15 in 1997. Health spending decreased by 16% between 1991 and 1994 and by 8% between 1994 and 1997. When we compare 1997 to the years 1991 and 1994, we come to the conclusion that either proportionally less money was spent on health care in 1997 or other factors not included in the relationship between GDP and health spending were growing proportionally stronger. Thus, either the formerly „luxurious“ medical services became affordable or other factors like structural change and/or the introduction of new institutional rules or new “market systems“ were growing increasingly dominant.

2.1 EU COUNTRIES INCITE A DECELERATED GROWTH IN EXPENDITURE

According to our calculations, it is above all the EU countries which seem to incite a slow-down in the rise of health spending compared to changes in GDP. The cross-section analysis of the relative rise in health spending shows that the elasticity was decreasing by 25% between 1991 and 1997 when it reached 1.05. This development may be due to the EU member states' immense efforts to meet the convergence criteria for participation in the monetary union. In this context it has to be pointed out that the share of health spending in overall public expenditure accounts for 10 to 20% within the EU. The income elasticity of those 11 European countries which already qualified for participation amounted to 0.98 between 1996 and 1997 and thus just failed to reach 1 - a fact which constitutes a further indicator for a decelerated growth in expenditure.



2.2 INDIVIDUAL COUNTRIES INFLUENCE WORLDWIDE GROWTH IN EXPENDITURE

Model 1		Cross-section measurement			
		dependent variable: health spending per capita \$ PPP			
		1991	1994	1996	1997
All the countries-21 (R ² =0.80-0.88)	constant	-3.45	-2.38	-2.16	-1.71
	term (t-value)	(-5.67)	(-5.38)	(-4.32)	(-3.91)
EU-15 (R ² =0.63-0.77)	log GDP	1.55	1.30	1.25	1.15
	(t-value)	(10.59)	(12.36)	(10.54)	(11.16)
EU-11 (R ² =0.53)	constant	-2.82	-1.70	-1.59	-1.32
	term (t-value)	(-3.12)	(-2.21)	(-1.66)	(-1.94)
	log GDP	1.40	1.14	1.11	1.05
	(t-value)	(6.52)	(6.29)	(4.96)	(6.65)
	constant	--	--	-1.02	-1.01
	term (t-value)			(-0.85)	(-1.20)
	log GDP	--	--	0.98	0.98
	(t-value)			(3.48)	(5.02)

GDP: gross domestic product per capita \$PPP

t-value: Test statistics for the coefficients. A value ≥ 2 confirms the hypothesis that GDP per capita significantly correlates with health spending per capita (error probability of 5%).

R²: coefficient of determination regarding the strength of the relationship between GDP and health spending

Sources: see tables A2 and A3, calculations by IHS-HealthEcon.

However, a cross section analysis has a disadvantage because it assumes that all countries under investigations have similar preferences concerning their health care system. In addition such an analysis cannot embrace real changes that took place within the period studied and/or structural breaks. When looking at our cross-section study, we see that the relative change in health spending amounted to 1.45 over time. If we include Switzerland and the USA into our analysis, the change accounts for 1.29%.⁴ Our results are generally in keeping with those obtained in other studies (see footnote 2). The measurement of fixed effects in one model of this study, however, lessens the stability of our parameters which may be due to different determinants not included into the relationship between growth in health spending and GDP in the various countries. The amount of elasticity is thus also dependent on other factors which exert a certain kind of influence on health care expenditure⁵.

⁴ The estimation of a fixed effect model showed that "time" did not influence any of the samples studied. Though, the relative increase in health spending was significantly influenced by some of the bigger EU member states where expenditure on health care either grew excessively or proportionally weaker in relation to the rise in GDP.

⁵ Blomqvist et al. suggested that all the calculations of elasticity overestimated its real level which was

With a low 0.78, the relative change in health spending was out of proportion in the Czech Republic, Hungary, Poland and Slovenia (MOEL-4) in 1996. This result corresponds to findings obtained in other studies, in which GDP did not correlate significantly with health spending and in which no reasonable results could be obtained for 1997. According to calculations by the World Bank, the elasticity of health spending lies between 0.8% and 1.08% in low-income countries (less than US\$ 785 per capita) and amounts to 1.10% in "middle income countries" (between US\$ 786 and US\$ 9,635 per capita).⁶ Apart from the fact that an updating of components included in the national account distorted the national statistics of transition countries, there might be striking disproportionalities between the development of the health care systems and the pace of overall economic growth which are inefficient on a macroeconomic basis. This trend is further reinforced by the fact that potential life years lost (before age 65) in Central and Eastern Europe are approximately 60% higher than the EU average.⁷

3 THE ROLE OF THE PRICES IN A HEALTH CARE SYSTEM

While the relative increase in health spending took place at a steady pace during the 1980s, it experienced a slow down in the first half of the 90s. In addition to that the gap between the annual increase in GDP and the annual rise in health care expenditure widened. The problems with the measurement of price indices surely account for part of the increasing gap but inefficiencies, as well as excessive charges may also be held responsible for the change.

particularly due to country-specific factors that had not been taken into account but had nevertheless correlated with income. Their criticism, however, refers far more to the methods applied than to the contents. Blomqvist, A.G., Carter, R.A.L.: Is Health Care really a luxury? *Journal of Health Economics* 16 (1997), p. 207-229.

⁶ The World Bank: *World Development Indicators 1998*, Washington D.C., p. 91.

⁷ Hofmarcher, M. M: Is Public Health Between East and West? Analysis of Wealth, Health and Mortality in Austria, Central and Eastern European Countries, and Croatia Relative to the European Union, *Croatian Medical Journal* 39/3 (1998), p. 241-248.

3.1 REAL SPENDING PER CAPITA IS UP IN NEARLY ALL THE COUNTRIES

It is rather striking that relative prices, as well as real spending per capita were growing strongly although differences in the set-up and financing of the various health care systems were persisting. At constant 1990 prices, real spending per capita experienced an average annual rise of 1.25% in Germany, 1.93% in the USA, 2.12% in Switzerland and 3.59% in France between 1981 and 1996. In Austria the expenditure rose by 1% within the same period of time whereas real GDP increased by 1.73% a year. Throughout the 80s nominal, as well as real growth rates developed concurrently without major gaps between levels.

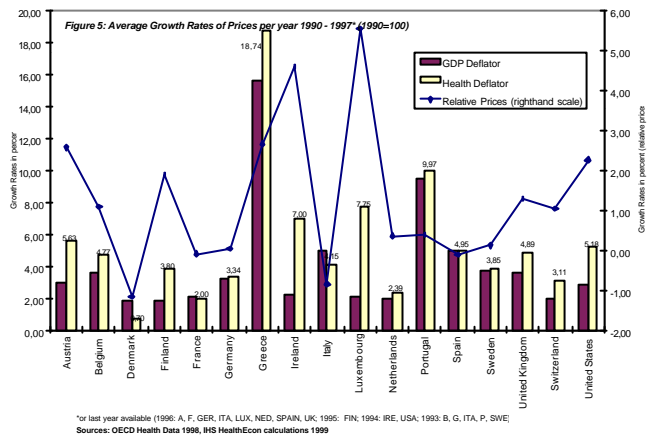
3.2 THE REAL INCREASES CHANGE AS THE GAP BETWEEN GROWTH RATES WIDENS

In Austria, France, Germany, the Netherlands, Switzerland, Great Britain and the United States, the real rise in GDP per capita amounted to an average of 1.40% between 1981 and 1996 while the increase in real health spending per capita accounted for 1.92% within the same period of time. Table 2 shows that between 1983 and 1989 real per capita growth rates equalled 2.55 and 2.72%. From 1990 to 1996, however, they experienced a slow-down to 0.42 and 1.25%. Within these periods, the increase in real spending per capita was diminishing by an average of more than 50% while real GDP per capita was suffering an even stronger decrease. This development led to a displacement effect, as well as to a widening in the gap between the two growth rates. Both real

increase in income and real rise in spending were below average with the latter being a bit higher in all the countries except for the USA, Switzerland, and Austria between 1990 and 1996. Within our three periods of observation the Dutch health care system grew slightly less in relation to the other countries' systems.

Real per capita growth has been quite consistent during the 80s. However, in the first half of the 90s the tendency became heterogeneous while nominal spending per capita grew much stronger than GDP per capita. The sometimes significant differences between the institutional set-ups of the various health care systems might have become stronger in recent years. Massive structural changes as for example the introduction of so-called "quasi-markets" which have by now become a rather common feature in Finland, Italy, Spain, Sweden, Great Britain etc. might incite a medium-term price increase.

Apart from ever increasing transaction costs



	Growth rates of the gross national product per capita (GDP) and health spending per capita (HS)											
	1981-1996				1983-1989				1990-1996			
	nominal		real		nominal		real		nominal		real	
	GDP	HS	GDP	HS	GDP	HS	GDP	HS	GDP	HS	GDP	HS
Austria	5.19	6.14	1.73	1.00	5.46	6.98	2.21	2.20	4.18	5.86	1.05	0.42
France	5.73	7.21	1.32	3.59	6.89	8.06	2.12	4.38	2.72	4.25	0.54	2.21
Germany	3.75	4.56	0.93	1.25	4.73	4.36	2.68	2.49	2.02*	4.83*	-1.21*	1.44*
Netherlands	3.56	3.94	1.77	1.71	3.25	3.14	2.40	1.91	3.51	3.97	1.51	1.46
Switzerland	3.66	5.93	0.38	2.12	5.46	6.82	2.25	3.62	1.15	3.65	-1.25	0.14
Great Britain	7.11	8.23	2.16	1.84	8.91	8.37	3.47	1.76	4.75	7.24	1.12	2.24
USA	4.89	7.77	1.51	1.93	6.38	8.76	2.74	2.69	3.59	5.50	1.14	0.86**
Average growth	4.84	6.25	1.40	1.92	5.87	6.64	2.55	2.72	3.13	5.04	0.42	1.25

*including Eastern Germany

**deflator of health spending estimated for 1995 and 1996

Sources: OECD Health Data 1998, Central Statistical Office, May, June 1998, IHS-HealthEcon – calculations for 1999.

regarding the drawing-up of price lists for medical services, contracts etc., the practical problem consists in the rather costly elaboration of "real" bargaining prices.

According to new findings⁸ Great Britain and Sweden are particularly engaged in a reexamination of the concept of market liberalization in the field of health care with the emphasis being once again placed on the planning competence of the communities.⁹

3.3 RELATIVE PRICES ARE UP

Figure 5 shows both the rate of price increase and the relative prices¹⁰ then current in the EU member states, Switzerland and the USA. Except for Denmark, France, Germany, Italy and Spain the rise in prices for medical services sometimes lay way beyond other price increase rates, which holds also true for Austria. At constant 1990 prices, relative prices accounted for 2.58 in 1996 (right scale) which shows that the price increase in the health care sector was more than twice as high as the overall rise in prices. It is, however, difficult to assess whether prices are overcharged when we have no information whatsoever on possible improvements in productivity.¹¹ The only thing we are able to derive from figure 5 is that these prices increased more rapidly than others in 12 out of 17 countries. There are various factors which surely contribute to a distortion or exaggeration of the extent of price increase on health care markets, as for example unascertained improvements in productivity¹², an excessive rise in the amount of goods used and services performed and problems

⁸ Interview with Victor Fuchs, *Health Affairs* 17/1 (1998), p. 91-96. Fuchs points out that the change in European health spending which unfolds much more slowly than in the USA has to be particularly attributed to supply side constraints (p. 95).

⁹ Saltman, R. B., Figueras, J.: *European Health Care Reform: Analysis of Current Strategies*, WHO Regional Office for Europe, 1997, Copenhagen.

¹⁰ Relative prices indicate for example in how far a country's prices for health care services change in relation to other prices.

¹¹ If "potential life years lost" is regarded as a proxy indicator for improvements in productivity, Austria ranks first among all the other countries studied. (see also Hofmarcher, M.M.: *Das Gesundheitswesen in Österreich, neue Trends, neue Fakten, IHS Working Paper Nr. 19 (1997)*, Vienna.

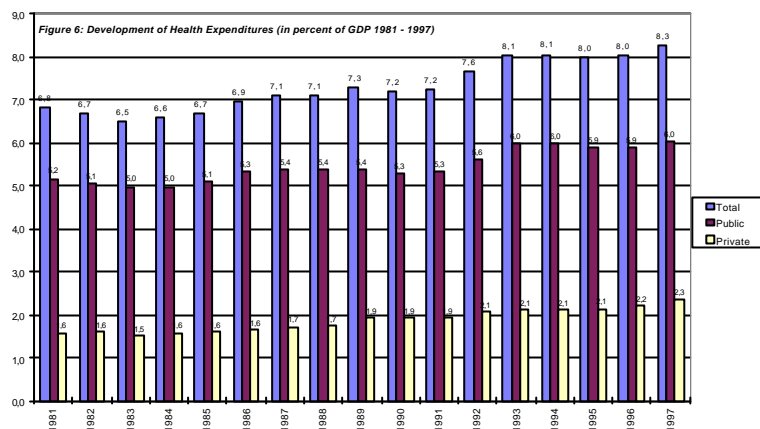
¹² Weisbrod (1991) and Newhouse (1992) describe the impact of technological changes and research on the spending trend in a health care system. Weisbrod, B.A.: "The Health Care Quadrilemma: An Essay on Technological Change, Insurance, Quality of Care and Cost Containment", *Journal of Economic Literature* 29 (1991), p. 523-52; Newhouse, J.P.: "Medical Care Costs: How much Welfare Loss?", *Journal of Economic Perspectives* 6/3 (1992), p. 3-21.

to survey output and results, as well as their changes in quality over time. A special price index for health care systems might be used to ascertain improvements in productivity. Measuring difficulties concerning the indices which usually occur when inflation rates are being calculated explain part of the differences between the rates of price increase, however, inefficiencies and overestimated prices may also influence price development in the health care sector.

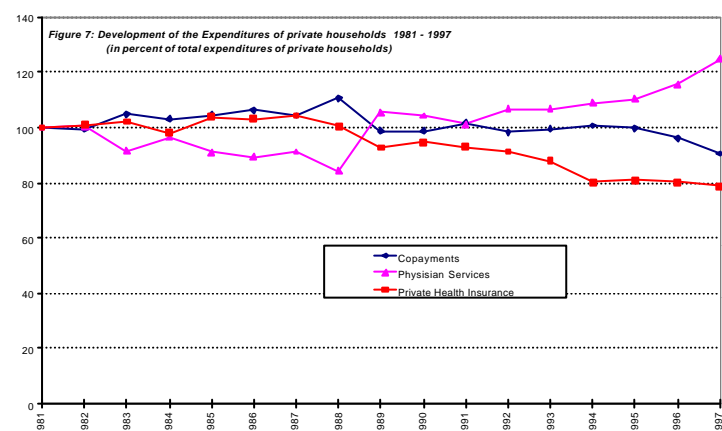
AUSTRIA

1 DEVELOPMENT IN HEALTH SPENDING AND TRENDS CONCERNING THE FACTORS CONNECTED WITH IT

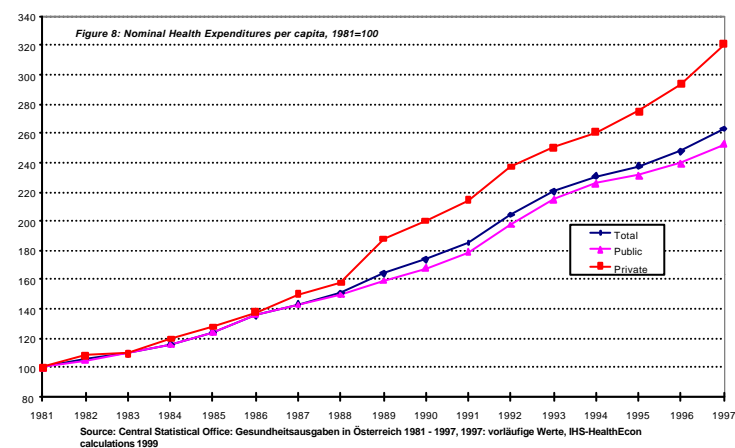
The propensity to consume health services is high in Austria and thus Austrians consider health care apparently as a superior good. In real terms, however, health spending experienced a lower increase than GDP per capita . With regard to a rise in services performed, a flood of new goods and services available and an ever increasing life expectancy, this result clearly contradicts every experience made so far. However, significant measuring difficulties and overcharged prices in the private sector which in the view of an ever rising consumption expenditure put a particular burden on private households might explain this development.



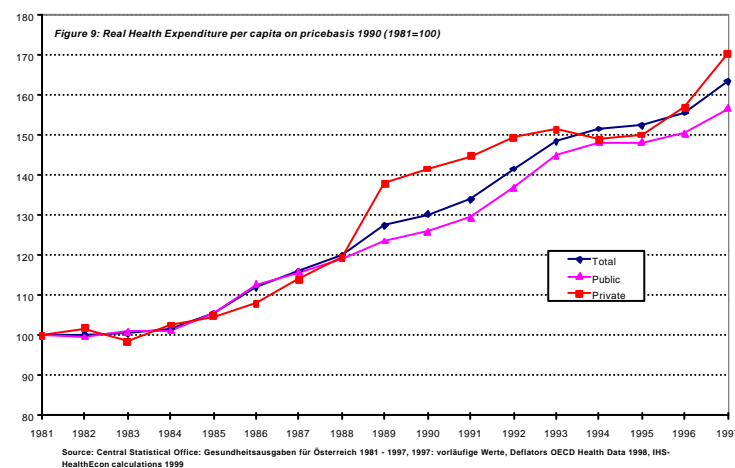
Source: Health Expenditure in Austria 1981 - 1996, Statistische Nachrichten 5 (1998), S.384-387, Gesundheitsausgaben 1997: vorläufige Werte, IHS-HealthEcon calculations 1999



Quelle: Central Statistical Office: Gesundheitsausgaben in Österreich 1981-1997, GA für 1997: vorläufige Werte, Dezember 1998, IHS-HealthEcon calculations 1999



Source: Central Statistical Office: Gesundheitsausgaben in Österreich 1981 - 1997: vorläufige Werte, IHS-HealthEcon calculations 1999



Source: Central Statistical Office: Gesundheitsausgaben für Österreich 1981 - 1997: vorläufige Werte, Deflatoren OECD Health Data 1998, IHS-HealthEcon calculations 1999

In 1997 overall health care expenditure¹³ amounted to 8.3% of the GDP and was thus 21.4% higher than in 1981. Public health spending increased by 16.4%. The private households' consumption expenditure, however experienced a rise of 48% between 1981 and 1997 (fig. 6). Figure 7 shows that the private households' spending on physician services as share of their overall health spending increased by 25% within the period studied. Compared to public expenditure, private health spending per capita rose excessively. Figure 8 documents the development of nominal spending per capita. From 1981 to 1997 private health spending more than tripled. At the end of our period of observation the increase in private health spending was 27% higher than public health care expenditure, which, however, had also more than doubled from 1981 to 1997. With regard to the prices charged in 1990¹⁴ real private spending per capita rose by 70% (see fig. 9).

As demonstrated in table 3, the average rise of private spending on medical services amounted to slightly more than 10% a year and was thus twice as high as the increase in both copayments and expenditure on private health insurances. Within our period of observation, the nominal health spending of private households rose by 8.03% with the growth rate amounting to 8.4% between 1982 and 1989 and to 7.7% from 1990 to 1997.

Between 1981 and 1997 public spending increased by 6.4% with overall public spending rising by 5.9% and overall health care expenditure increasing by 6.7%.

This slow-down in the rise of public spending was to a large extent due to a reinforced policy of budget consolidation which also affected social insurance carriers that have financed at least 80% of overall public expenditure. Effective tools for a deceleration of the increase in spending were scarcely granted contracts with physician practices, efficient negotiations with pharmaceutical companies, as well as the budgeting of expenditure in certain fields of health care.

The sharp increase in private spending on medical treatment could be due to people's ever growing preference for specialists who have no contract with social insurance companies. In addition, since

¹³ Gesundheitsausgaben in Österreich laut OECD/VGR - concept; 1981 - 1997: Central Statistical Office, December 1998.

¹⁴ Both nominal and overall public health spending were adjusted by means of the GDP deflator. Private spending, however, was adjusted with the help of the price index regarding private consumption of medical services which can be found in the OECD Health Data 1998.

		1981-1997	1982-1989	1990-1997
Health spending	public	6.43	6.32	6.74
	private	3.30	8.42	7.70
Private households	direct share in costs	7.36	8.33	6.35
	medical treatment	9.35	9.17	10.48
	private health insurances	6.44	7.11	4.94
Gross national product		5.42	5.39	4.79
Total amount of public spending		5.86	5.5	5.65
Total amount of health spending		6.70	6.67	6.85

Source: Central Statistical Office, December 1998, calculations by IHS-HealthEcon, 1999.

1996 only 80% of the fees contracted with other physicians have been covered by social insurance. This analysis, however, is by no means clear on the question whether the Austrians' preference for private physicians arises from both a stronger health awareness and higher disposable income and /or whether the increased deductible is responsible for the dynamic change in health spending. It is highly probable, however, that a mixture of both trends accounts for the Austrian status-quo.

We are not able to give a detailed enumeration of reasons why private health spending rose so excessively, however, the data seem to indicate that the Austrians' increased care for their health manifested itself in a higher consumption of health care services. As already mentioned before, health is probably the population's supreme asset.

2 ELASTICITIES OF HEALTH SPENDING IN AUSTRIA BETWEEN 1981 AND 1997

Between 1981 and 1997 nominal GDP per capita rose by 1% whereas the increase in nominal health spending per capita within a 9,5% confidence limit ranged between 1.24% and 1.37%. Within the same period of time private consumption expenditure experienced a proportional rise of 1.68% while public consumption spending grew by 1.25%. Between 1990 and 1997 health spending rose more slowly than GDP which, however, does not hold true for private health care expenditure that grew particularly fast between 1990 and 1997 and was higher than public health spending in this period (see table 4). By using the deflator for Austrian health care expenditure, we see that elasticity ranged between 0.63 and 0.86% (within a 95% confidence limit) which means that real health spending rose degressively in relation to real GDP per capita.¹⁵ With regard to an increase in services performed, a variety of new goods and services, as well as a steadily rising life expectancy, these results contradict every experience made so far. Even if the whole period of time is divided into smaller units, this leads to an equally excessive

HS		co-efficient	confidence belt of 95%		constant term	confidence belt of 95%		coefficient of determination
		GDP	lower limit	upper limit		lower limit	upper limit	
total	1981-1997	1.30***	1.24	1.37	-2.76***	-3.09	-2.42	0.99
	1982-1989	1.31***	1.16	1.46	-2.78***	-3.58	-1.98	0.98
	1990-1997	0.65***	0.54	0.76	2.62***	2.16	3.08	0.97
private	1981-1997	1.68***	1.41	1.95	2.62***	2.19	3.06	0.92
	1982-1989	1.57***	1.25	1.89	-4.78***	-6.44	-3.12	0.95
	1990-1997	1.65***	1.45	1.84	-5.20***	-6.27	-4.12	0.98
public	1981-1997	1.25***	1.18	1.31	-2.58***	-2.94	-2.23	0.99
	1982-1989	1.26***	1.12	1.40	-2.65***	-3.41	-1.90	0.99
	1990-1997	1.49***	1.19	1.78	-3.89***	-5.48	-2.29	0.96

*** $p \leq 0.001$

Source: Central Statistical Office, December 1998, IHS HealthEcon-calculations1999.

rise in spending at the upper limits of the confidence belt.

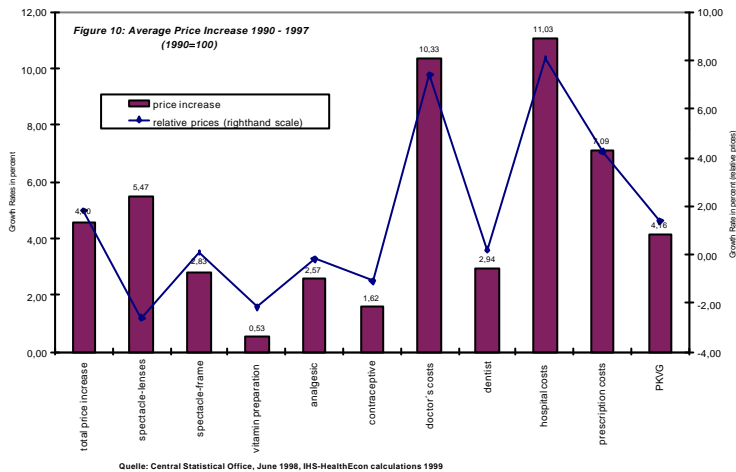


Figure 10 shows the increase in the Austrian health care system's prices split up into the individual components of the index. The costs for hospital treatment and the fees of physicians rose strongest tightly followed by prescription charges and the costs for new glasses. It is generally assumed, however, that the rise in the Austrian health care system's prices is overestimated¹⁵ since the individual factors of the price index only paint a rather selective picture of the real situation. The reason for this overestimation of prices is that the deflator reflects a trend in fees rather than market prices. It is furthermore assumed that certain measures of deregulation led to an increased competition in some fields of the health care system and thus provoked a decrease in prices in the 90s. From 1994 this development again stimulated the demand and in consequence also the consumption of health care services. It has to be taken into account, though, that even if the index is distorted and the fees do not represent market prices they may comprise monopoly rents which lead to an increase in prices and thus negatively affect the welfare. Recent debates on the charges for dental coronas show that the recommended price which was finally agreed upon is way beyond an equally realistic but less profitable price.

¹⁵ In an OECD cross-sectional study of 18 countries (1987) elasticity of real health spending amounted to 1.6%. OECD: *Financing and delivering Health Care* (1987), Paris.

¹⁶ According to information disseminated by the Central Statistical Office on June 8, 1998, price trends in health care were particularly overestimated from 1981 to 1989. Between 1990 and 1996 the real effect probably dominated the price effect. The hypothesis thus is that prices sank and turnover rose within this period because more money was spent on health care services.

3 THE HEALTH CARE SYSTEM WILL EXPAND FURTHER

The increase in the health care system's price indices¹⁷ beyond the rise in the overall economic price indices is usually explained by the fact that the system's productivity generally improves on a slower rate than overall economic productivity. This trend in turn is due to the fact that the health care system forms part of the service sector. If the service sector improves to a lesser extent than the economy as a whole, relative prices will rise in the course of time. In consequence, expenditure will increase since the demand for health care services is rather insensitive to price changes – a fact that at least holds true for the main fields of health care that cause more than 60% of overall health spending. It is particularly difficult to ascertain improvements in productivity in the field of health care because it is nearly impossible to measure the "final output". It is, however, rather illogical to assume that productivity has not been improved in our health care system's main branches, as for example in acute care. It is far more likely though hardly measurable, that productivity in health care does rise. If the quality of treatment is improved, it has but slight effects on the price indices. Therefore, it will be even more important in future to study factor flow and factor prices over a period of time, as well as to reasonably measure productivity with regard to output, i. e. to ascertain real effects of rapid product as well as process innovations in the health care sector.

¹⁷ Apart from the general level of prices, real income per capita, the use of technological innovations and the percentage of people over 65, the density of physicians was identified as a determinant in a recent study. This new factor, however, correlated negatively with the increase in prices. In consequence, we might suppose that the density of physicians does not simulate demand, as has been generally assumed so far, but that increased supply leads to a decrease in prices charged for medical treatment. Cebula, R. J.: Determinants of the inflation rate of the health care CPI in the US, *Applied Economic Letters* 5 (1998), p. 47-49.

APPENDIX

MEDIUM-TERM OUTLOOK FOR THE AUSTRIAN ECONOMY

After having amounted to 3.3% in 1998, real economic growth will decrease to 2.4% in 1999 and will hit a low of 1.9 % in the year 2000. The number of employees is expected to keep rising and will consequently surpass the 3-million line for the first time in 1999. The fluctuations of this rise are totally in keeping with the economic trend. After having grown steadily for a rather long time, the unemployment rate will slightly decrease with a more significant decline being expected for the year 2002. By 2000 labour productivity will have decreased to 1.6% but is supposed to rise to about 2% in the following years. In 1999 total wages and salaries will rise by 3.2% and experience further increase in the years to come. Since the number of employees is also on the rise, these figures cannot automatically be applied to the individual employee's increase in income which will in turn be up to 0.5% below the aggregate amount of increase. Social insurance contributions will rise to a similar extent. Since the real income of private households keeps increasing, a growth in real consumption by 3.4% (in 1999) or 3.9% (in 2000) may be expected with the personal savings ratio remaining on a rather low 8%. Both the low inflation rate and the poor interest rate support this tendency.

In the last six months all the institutions concerned

with economic outlooks have again reduced their expectations for medium-term growth because the financial turmoil of Eastern Asia has had consequences on the economies of Russia and South America and will also affect the slightly accelerated growth in Europe in the near future. Since the worldwide economic recovery seems to take much more time than was expected, the economic recession due for 1999 may set in as late as 2000. For the years following 2000 the experts at OECD and NIESR (National Institute of Economic and Social Research) expect a moderate acceleration of economic activity in all the EU member states. This trend could incite a growth in the various health care systems, as well as a rise in improvements in productivity.

Table A1	Ratios for the Austrian economy						
	1994	1995	1996	1997	1998	1999 ²	2000 ²
GDP based on the prices of 1983 ¹	1601.65	1628.70	1660.98	1702.84	1759.58	1801.45	1835.85
		1.7%	2.0%	2.5%	3.3%	2.4%	1.9%
nominal GDP ¹	2237.94	2328.74	2414.64	2514.37	2626.25	2724.06	2827.01
		4.1%	3.7%	4.1%	4.4%	3.7%	3.8%
Employees	2971.650	2972.259	2955.750	2968.506	2998.999	3014.755	3023.117
		0.0%	-0.6%	0.4%	1.0%	0.5%	0.3%
Unemployment rate	6.54	6.6	7.0	7.1	7.2	7.1	7.1
Change expressed in percentage points		0.0	0.5	0.1	0.1	-0.1	0.0
Pavroll according to National Accounts ¹	1195.303	1237.075	1252.986	1267.509	1305.936	1347.290	1393.730
		3.5%	1.3%	1.2%	3.0%	3.2%	3.4%
Total wages and salaries per employee ⁴	325.300	337.313	343.659	345.962	352.978	362.430	374.685
		3.7%	1.9%	0.7%	2.0%	2.7%	3.4%
Labour productivity ⁴	538.977	547.966	561.946	573.634	586.722	597.538	607.272
		1.7%	2.6%	2.1%	2.3%	1.8%	1.6%
Adjusted rate of pay	70.01	69.12	68.13	66.45	65.78	65.73	65.83
Change expressed in percentage points		-0.9	-1.0	-1.7	-0.7	0.0	0.1
Revenues of social insurance	300.523	315.815	329.098	338.422	351.104	362.449	375.677
Change expressed in percentage points		5.1%	4.2%	2.8%	3.7%	3.2%	3.6%
Index of consumer prices based on 1966	342.50	350.18	356.69	361.37	364.64	368.51	374.13

¹ expressed in billions of ATS.

² IHS medium-term outlook, January 1999

³ Employees on maternity leave as well as employees doing their military /civil service are not included

⁴ expressed in thousands of ATS

Source: Mittelfristige Prognose der Österreichischen Wirtschaft 1998/99, Institute for Advanced Studies, January 1999.

Table A2	GROSS NATIONAL PRODUCT PER CAPITA										EU-15=100									
	Purchasing power parities expressed in U.S. dollars																			
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1990	1991	1992	1993	1994	1995	1996	1997	1998		
Austria	16712	17576	18581	19190	20036	20618	21965	22789	22262	110	110	111	111	110	109	111	110	109		
Belgium	16668	17538	19011	19699	20577	21107	21986	22902	22452	110	110	113	114	113	111	111	110	110		
Denmark	16557	17497	18096	19169	20419	21479	22669	23874	22679	109	110	108	111	112	113	114	115	111		
Germany	14626	17070	18453	18558	19747	20466	21622	22385	21741	96	107	110	108	109	108	109	108	107		
Finland	16203	15540	14868	15636	16330	17911	18634	19821	19814	107	97	89	91	90	94	94	96	97		
France	17358	18244	19003	18684	19279	19909	20464	21290	20695	114	114	113	108	106	105	103	103	101		
Greece	9187	9829	10680	11047	11700	12222	13143	13805	13608	60	62	64	64	64	64	66	67	67		
Great Britain	15907	15758	16600	16881	17558	17865	19055	20139	19669	105	99	99	98	97	94	96	97	96		
Ireland	11378	12149	13465	14255	15713	17198	18190	18875	20245	75	76	80	83	87	91	92	91	99		
Italy	16257	17198	18099	17717	18682	19460	20236	20914	20069	107	108	108	103	103	102	102	101	98		
Luxemburg	22809	24382	26523	28176	30178	31206	31677	33089	32679	150	153	158	163	166	164	160	160	160		
Netherlands	15926	16517	17424	17854	18838	19852	20481	21450	20964	105	104	104	104	104	105	103	103	103		
Portugal	9372	10167	10889	11431	12042	12457	12963	13672	14095	62	64	65	66	66	66	65	66	69		
Sweden	17011	16898	16908	16824	17543	18727	19419	20150	19528	112	106	101	98	97	99	98	97	96		
Spain	11856	12873	13287	13440	13743	14318	15162	15800	15593	78	81	79	78	76	75	76	76	76		
EU-15§	15188	15949	16792	17237	18159	18986	19844	20730	20406	100	100	100	100	100	100	100	100	100		
EU-EURO§	15379	16296	17237	17695	18651	19500	20307	21181	20964	101	102	103	103	103	103	102	102	103		
Switzerland	21223	21770	22829	23498	24173	24992	24608	25088	*	140	136	136	136	133	132	124	121	*		
USA	22224	22605	23600	24551	25764	26711	27821	29195	*	146	142	141	142	142	141	140	141	*		
Estonia	n.v.	8819	7283	6750	6697	7057	7407	8251	*	*	55	43	39	37	37	37	40	*		
Poland	5089	4718	4828	5000	5242	5565	5866	6271	*	34	30	29	29	29	29	30	30	*		
Slovenia	11878	10896	10333	10500	11087	11704	12308	12776	*	78	68	62	61	61	62	62	62	*		
Czech Republic	10027	8825	8268	8200	8414	8759	9184	9193	*	66	55	49	48	46	46	46	44	*		
Hungary	7471	7224	6375	6200	6400	6558	6789	7088	*	49	45	38	36	35	35	34	34	*		
MOEL-5§	8616	8096	7417	7330	7568	7929	8311	8716	*	57	51	44	43	42	42	42	42	*		

§ unweighed average.

Sources: OECD-Health Data 1998, data for central and eastern european countries (MOEL-5): Nationale Statistics, WHO Health for All Database 1999, GDP 1998: Eurostat: table agc01u16 ESVG-Aggregate zu jeweiligen Preisen - in \$PPP, IHS-HealthEcon calculations 1999.

Table A3	OVERALL HEALTH SPENDING PER CAPITA								EU-15=100							
	Purchasing power parities expressed in U.S. dollars															
	1990	1991	1992	1993	1994	1995	1996	1997	1990	1991	1992	1993	1994	1995	1996	1997
Austria	1204	1272	1409	1529	1594	1641	1748	1793	106	103	105	110	110	109	110	109
Belgium	1248	1382	1516	1600	1656	1664	1708	1747	110	112	113	115	114	110	108	106
Denmark	1364	1429	1486	1608	1677	1708	1802	1848	120	115	111	116	116	113	114	112
Germany	1279	1603	1834	1847	1982	2128	2278	2339	112	129	137	133	137	141	144	142
Finland	1292	1416	1384	1310	1290	1370	1380	1447	113	114	103	94	89	91	87	88
France	1539	1656	1783	1834	1874	1971	1983	2103	135	134	133	132	130	131	125	128
Greece	386	415	476	549	636	703	888	974	34	33	35	39	44	47	56	59
Great Britain	955	1021	1151	1165	1213	1234	1317	1347	84	82	86	84	84	82	83	82
Ireland	759	855	982	1047	1124	1204	1276	1324	67	69	73	75	78	80	81	80
Italy	1321	1449	1540	1515	1562	1503	1584	1589	116	117	115	109	108	100	100	97
Luxemburg	1495	1575	1743	1891	1956	2077	2139	2340	131	127	130	136	135	138	135	142
Netherlands	1326	1417	1536	1599	1652	1743	1766	1825	116	114	115	115	114	116	112	111
Portugal	614	731	806	875	941	1025	1071	1125	54	59	60	63	65	68	68	68
Sweden	1492	1462	1496	1504	1533	1590	1675	1728	131	118	112	108	106	106	106	105
Spain	815	900	974	1010	1015	1042	1115	1168	72	73	73	73	70	69	70	71
EU-15§	1139	1239	1341	1392	1447	1507	1582	1646	100	100	100	100	100	100	100	100
EU-EURO§	1172	1296	1410	1460	1513	1579	1641	1709	103	105	105	105	105	105	104	104
Switzerland	1760	1937	2115	2197	2288	2403	2499	2547	154	156	158	158	158	159	158	155
USA	2799	3035	3276	3468	3628	3767	3898	4090	246	245	244	249	251	250	246	248
Estonia	538	480	482	675	735	749	687 ⁺	798 ⁺	47	39	36	48	51	50	43	48
Poland	224 ⁺	216	234	229	219	225 ⁺	371	323 ⁺	20	17	17	16	15	15	23	20
Slovenia	311	311	449	654	743	856 ⁺	976 ⁺	1097 ⁺	27	25	33	47	51	57	62	67
Czech Republic	538	480	482	675	735	749	904	922 ⁺	47	39	36	48	51	50	57	56
Hungary	322 ⁺	391	424	406	459	562	602	626 ⁺	28	32	32	29	32	37	38	38
MOEL-5§	386 ⁺	376	414	528	578	628 ⁺	713 ⁺	753 ⁺	34	30	31	38	40	42	45	46

§ unweighed average. Estimates achieved by extrapolation.

Sources: OECD-Health Data 1998, WHO Health for All Database 1999, yearbook of the polish statistical office 1997, table 7 (697) p. 505, yearbook of the polish statistical office 1997, table 24-15 p. 585, IHS-HealthEcon calculations 1999.

Table A4	Public health spending								EU-15=100							
	as percentage share in overall health spending															
	1990	1991	1992	1993	1994	1995	1996	1997	1990	1991	1992	1993	1994	1995	1996	1997
Austria	73.5	73.4	73.3	73.9	74.1	73.3	72.0	72.0	92	92	92	93	94	93	94	94
Belgium	88.9	88.1	88.9	88.9	87.9	87.8	87.7	87.6	111	111	112	112	112	112	114	115
Denmark	86.1	86.6	86.7	86.3	86.6	86.1	65.2	65.0	108	109	109	109	110	110	85	85
Germany	76.2	78.2	78.5	77.6	77.6	78.2	78.3	77.4	95	98	99	98	99	100	102	101
Finland	80.9	81.1	79.6	76.3	74.8	74.7	78.4	77.0	101	102	100	97	95	95	102	101
France	74.5	74.7	74.6	74.2	78.4	80.6	80.7	78.4	93	94	94	94	100	103	105	102
Greece	82.3	80.2	76.1	76.2	76.2	75.8	77.5	74.8	103	101	96	96	97	97	101	98
Great Britain	84.1	83.7	84.5	84.8	84.1	84.4	84.5	84.5	105	105	107	107	107	108	110	110
Ireland	72.9	74.4	75.1	75.3	75.2	74.7	74.2	75.0	91	93	95	95	95	95	96	98
Italy	78.1	78.4	76.3	73.1	70.6	69.3	69.8	69.9	98	98	96	92	90	88	91	91
Luxemburg	93.1	93.0	92.8	92.9	91.8	92.4	92.6	91.8	117	117	117	118	117	118	120	120
Netherlands	72.7	74.1	77.4	78.3	77.5	76.7	72.1	72.0	91	93	98	99	98	98	94	94
Portugal	65.5	62.8	59.6	63.0	63.4	60.5	59.8	60.0	82	79	75	80	80	77	78	78
Sweden	89.9	88.2	87.2	85.7	84.6	83.4	83.0	83.3	113	111	110	108	107	106	108	109
Spain	78.7	78.7	78.7	79.1	78.7	78.7	78.7	78.7	99	99	99	100	100	100	102	103
EU-15§	79.8	79.7	79.3	79.0	78.8	78.4	77.0	76.5	100	100	100	100	100	100	100	100
EU-EURO§	77.7	77.9	77.7	77.5	77.3	77.0	76.8	76.3								
Switzerland	68.4	68.6	70.1	71.8	72.1	72.3	70.0	69.9	86	86	88	91	92	92	91	91
USA	40.7	41.9	42.9	43.5	44.8	45.9	46.7	46.7	51	53	54	55	57	59	61	61
Estonia	*	*	*	*	*	*	88.0	87.0	*	*	*	*	*	*	114	114
Poland	100.0	94.1	93.6	93.5	93.5	93.1	92.7	93.0	125	118	118	118	119	119	120	122
Slovenia	100.0	100.0	100.0	93.0	91.0	89.7	89.1	88.3	125	125	126	118	116	114	116	115
Czech Republic	96.2	96.7	95.4	94.8	93.9	92.6	92.4	92.0	121	121	120	120	119	118	120	120
Hungary	100.0	100.0	91.9	71.1	71.7	69.8	69.3	69.1	125	125	116	90	91	89	90	90

§ unweighed average,

Sources: WHO Health for All Database 1999, OECD-Health Data 1998, calculations by IHS-HealthEcon, 1999.