Swedish Association of Local Authorities and Regions

The Swedish Healthcare System:

How Does It Compare with Other EU Countries, the United States and Norway?

2008

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Preface

Swedish health care, which is financed primarily by tax revenues, consumes almost one tenth of society's total resources. Thus, it is vital for both patients and all other citizens that the resources be used wisely and cost-effectively. Cost-effective use of resources is also important given that the healthcare system faces major challenges as diagnostic and treatment methods rapidly improve. The more cost-effective the system, the better it is positioned to confront demographic challenges and take advantage of medical progress.

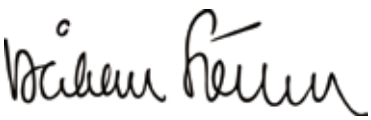
In the light of the challenges that healthcare systems face, the European Commission has stressed the importance of high-quality results for the entire population within the framework of economic sustainability.

The Swedish Association of Local Authorities and Regions (SALAR) prioritises the support of local authorities and regions in their effort to improve the quality and cost-effectiveness of health care.
As part of that initiative, the SKL joins the Swedish National Board of Health and Welfare (NBHF) in publishing an annual Open Comparisons report of healthcare quality and cost-effectiveness. We also issue ongoing reports concerning productivity trends in the area of health care.

One purpose of the various reports is to shed light on cost-effectiveness issues surrounding the Swedish healthcare system. One way of examining how well resources are used is to compare the cost-effectiveness of Swedish health care with that of other countries. This report compares the Swedish healthcare system with those of the other EU 15 countries (those that were members before the expansion in May 2004), as well as Norway and the United States.

This is the second report that SKL has published comparing Swedish health care with that of other countries. The first such report was published in 2005. Roger Molin wrote this report. Alessandra Cavalieri-Persson developed the indicators that appear in the Appendix. Mattias Elg and Lars Witell, both fellows at Linköping University, put together the cost-effectiveness index presented by the report. Consultant Sven-Eric Bergman gathered data about the healthcare systems of other countries and international comparisons.

Stockholm, June 2008



Håkan Sörman
Executive Director, Swedish Association of Local Authorities and Regions

Summary

The conclusion of SALAR's first international comparison in 2005 was that the Swedish healthcare system performs well in relation to other countries. That was true with respect to availability, quality and results. Meanwhile, the costs were modest – in other words, Swedish health care was cost-effective. The conclusion was based on SALAR's indicator-based comparison, as well as comparisons performed in 2003-2004 by researchers and institutions in Canada, the Netherlands, the UK and France.

This report repeats the comparison, supplemented with cumulative indexes of results, costs and cost-effectiveness. In addition, the report presents three new international comparisons, performed in 2005-2007 by a Swedish company and two different Canadian institutes, that include Sweden.

This report concludes that Swedish health care stacks up well against that of the other countries. The cost-effectiveness index that we based on indicators of results and costs ranks Sweden third after Finland and Spain among the 17 countries compared.

The three new international comparisons performed by other organisations also rank Sweden high: second (behind Australia) of 27 countries, third (behind Switzerland and Japan) of 17 countries, and sixth (behind Austria, the Netherlands, France, Switzerland and Germany) of 29 countries. The various comparisons include a total of more than 30 countries. The comparisons vary in their approach to weighing the different healthcare systems against each other, as well as measuring quality and cost-effectiveness.

The survey performed by the Swedish company Health Consumer Powerhouse (HCP) was the only one in which Sweden is not among the top three. HCP gives Swedish health care top marks in the areas of medical quality, availability to the general population and the introduction of new pharmaceuticals, but ranks its results for the outcome of waiting times so low that it comes in 6th out of 29 countries.

Thus, regardless of approach and the countries compared, Sweden consistently ranks relatively high. The main reasons are that Swedish health care produces excellent outcomes at a modest cost. In other words, its overall cost-effectiveness is good. The Swedish population gets a good return on the money that it invests in health care.

It is important to note that the above assessment is relative, that Swedish health care is cost-effective in comparison with other countries. The position of the Swedish healthcare system does not rule out the possibility that it suffers from significant inefficiencies and therefore has room for improvement.

Also important to stress is that the ranking refers to the overall healthcare system of each country. That the Swedish system ranks high does not necessarily mean that it works well in all respects. There are areas, such as waiting times for planned treatment, in which a number of other countries perform better. No country performs best in all areas.

The healthcare systems in the countries included in the comparison are each designed differently.One difference is in financing, the foundation of any healthcare system. Healthcare systems are ordinarily broken down according to whether their primary financing comes from taxes or various types of insurance. Insurance-financed systems are often less comprehensive in terms of the percentage of the population covered and that which the public commitment includes. But the difference between the various systems has narrowed over time as public financing has generally risen to over 75 percent in the insurance-based systems. The countries in both groups vary with respect to the degree of local/regional financing. Among the countries with decentralised financing are Finland and Sweden, both of which are tax-based, and Belgium and Austria, both of which are insurance-based.

National financing is predominant, a trend that has strengthened in recent years. Denmark and Norway, which had decentralised, tax-financed systems, have transitioned to national financing. Some countries like Germany and the Netherlands, which had insurance-financed systems at both the national and local/regional levels, have moved more toward a centralised approach.

This report ranks Finland and Sweden, the two countries with decentralised, tax-financed healthcare systems, first and third in terms of cost-effectiveness. Spain, which is ranked second, has national tax financing but delegates responsibility for management and services to the regional level. The United States, whose system is most divided between the different levels and has the least public financing, ranks poorest.

Typical of the three countries at the top is that they have relatively few beds. That reflects the ability to restructure the system and introduce new medical technologies. That which obscures the assessment of Sweden are the long waiting times for planned, non-acute treatment. All Swedes have access to medical care but often have to wait too long for doctor's appointments and planned treatment.

Structure of the report

This report is broken down into three main sections. The first section discusses methodological issues in comparing different healthcare systems, as well as briefly describes the systems under consideration and the changes that have taken place in some of the countries over the past few years. The second section presents three international comparison that included Sweden: those conducted by Health Consumer Powerhouse (HCP) in Sweden, the Conference Board of Canada (CBC) and the Fraser Institute (FI) in Canada. The third section presents our indicator-based comparison of Sweden with the other EU 15 countries, Norway and the United States. The section also discusses indexes of results, resource consumption and cost-effectiveness for those countries. The report concludes with an appendix that considers each indictor separately.

Healthcare systems of the countries to be compared

This report focuses on how well the Swedish healthcare system performs in comparison with other countries. Many of the overall indicators of healthcare results that are common in international comparisons – such as premature death, life expectancy and infant mortality – are related not only to healthcare systems, but economic and social conditions as well. In order to minimise the impact of other conditions, the comparison is limited to the other EU 15 countries, Norway and the United States, i.e., industrialised Western nations with developed economies and circumstances that are fairly similar to Sweden. Relating healthcare results in these countries to costs enables an assessment of the cost-effectiveness of their systems.

Access to reliable, relevant data is always a problem when making international comparisons. As far as Sweden is concerned, it would be ideal to be able to compare Swedish health care with other countries on the basis of the same indicators that SALAR uses to compare different regions of the country. These Open Comparisons relate a large number of indicators of outcomes, availability of health care and patient experience to costs in order to assess cost-effectiveness. But inadequate access to data from the other countries prevents such a broadcased, comprehensive approach. Above all, there are insufficient data about availability of health care and patient experience, representing a serious limitation. The data is also inadequate when it comes to more specific indicators of quality, such as how often a procedure fails or how often the healthcare system causes patient injuries or infections.

In this regard, we have used material published by the Organisation for Economic Cooperation and Development (OECD) instead. The OECD Health Project was started in 2001 to develop indicators for comparing the performance of different healthcare systems. The goal is to contribute to improvements.

Despite the difficulties involved, it is increasingly common to compare and even rank various healthcare systems based on their performance and results. For instance, WHO's ranking of 191 countries in 2000 on the basis of expert assessments attracted a good deal of attention.

It was the first time that such a broad-based comparison had been performed between such disparate countries with completely different conditions and healthcare systems. The findings were surprising to many observers: countries not previously regarded as particularly successful wound up at the top of the list, and vice versa. Among the Western industrialised countries, the Mediterranean nations of France (1), Italy (2) and Spain (7) were ranked high, whereas Canada (30), Sweden (23), Denmark (34) and Germany (25) made a poorer showing. The United States, which has the most expensive healthcare system of all, came in 37th, the lowest rank for an industrialised country.

WHO planned to issue a new report in 2002, but it was initially postponed until 2003. The decision was based on criticism, primarily that the ranking had proceeded too much from judgmental assessments of experts. No new ranking has yet been published.

This report takes the most common approach to international comparisons, i.e., countries are compared on the basis of various indicators of healthcare results. In order to assess cost-effectiveness, results are related to resource consumption.

Many researchers long argued that the contribution of health care to improved health was relatively limited. They stressed other factors that are associated with

general improvements in living standards, such as more nutritious food, better hygiene and clean water. But as medicine has progressed, the role of the healthcare system in health, and even welfare, trends has been reconsidered.

A 2005 European Commission Report entitled The Contribution of Health to the Economy is a case in point. The report addressed the significance of healthcare systems for economic growth in rich countries. A WHO report several years ago showed a strong positive correlation between health promotion and economic growth in poor countries. The report concluded that the relationship existed in rich countries as well.

British researchers Ellen Nolte and Martin McKee also showed that healthcare improvements have had a positive impact on health in many countries, particularly when it comes to lower infant mortality rates, but also lower mortality among the middle-aged and elderly, especially elderly women.

Basing comparisons on results and cost-effectiveness indicators has the great advantage that only healthcare-related data are included. There is no need to analyse and assess dissimilarities in the way that various countries finance, structure and organise health care, such as whether it is good or bad to have few beds at hospitals, short periods of medical care, a high percentage of general practitioners, many doctor's appointments per citizen, a large percentage of private caregivers, etc.

Current changes in healthcare systems

The population continues to age throughout the Western world. That increases the need for healthcare interventions in terms of treatment, care and prevention alike. Medical progress, which has broadened the range of diagnostic and treatment options, also poses new challenges to healthcare systems.

That is the case for all of the countries included in our comparison. Sweden, in which the percentage of elderly has increased the most, has faced the greatest challenges so far. However, health economic research indicates that results and costs are related not only to demographics and medical progress, but that the design of healthcare systems play a major role in cost-effectiveness, i.e., the results achieved at a particular cost.

To deal with these challenges, a number of countries have reviewed and revamped their healthcare systems. In order to improve the ability of the healthcare system to evolve, the Swedish Committee of Accountability has proposed that the current regions be replaced by 6-9 regional municipalities with autonomous taxation rights and responsibility for both health care and regional development issues. In accordance with the proposal, Sweden would retain its decentralised healthcare system but have fewer regional units. The extent to which the committee's proposal will be implemented remains an open question.

The Swedish healthcare system is comparatively decentralised. The 20 regions and 290 local authorities, with their popularly elected officials and autonomous taxation rights, finance and provide most of the health care in their particular areas of responsibility. The national government and parliament have overall responsibility for Sweden's healthcare system.

The other Scandinavian countries have long had similar healthcare systems characterised by extensive decentralisation and an emphasis on regional taxation. But they have now chosen different approaches. The state has taken over healthcare

financing in both Norway and Denmark. Norway has even nationalised the management of hospitals. Sweden and Finland still have decentralised healthcare systems.

In 2006, the Netherlands changed its healthcare system as well. The country previously had a decentralised insurance system in which approximately two thirds of the population was covered by mandatory health insurance, while the remainder, mostly people above a certain income bracket, carried private insurance. The system has now been replaced by more comprehensive, mandatory insurance. In addition, everyone is entitled to purchase supplementary voluntary insurance. The state determines what is covered by the mandatory component and is responsible for approximately 5 percent of financing.

Germany is also in the process of reforming its healthcare system. Among the changes is that all citizens will be guaranteed the right to health insurance. Insurers will be obligated to offer at least a basic policy to the approximately 200 000 people who are currently not covered by the system. Starting in 2009, insurance premiums will be set at the national level and some of the financing will be shifted to taxation.

The British system is not undergoing any major overhaul. Nevertheless, the orientation has changed in a number of key respects over the past few years. The healthcare system was deemed to be underdeveloped by European standards and has received additional resources. Healthcare expenditures went from 7 percent of GDP in 2000 to more than 9 percent in 2007. Meanwhile, centralised control has strengthened. Several independent national institutes have assumed responsibility for regulation, monitoring and assessment.

Discussion in the United States revolves around two related issues: high healthcare costs in relation to poor results, and the more than 40 million citizens who are uninsured, as well as those who have poor or unreliable coverage. Not surprisingly, financing of health care is an important domestic issue in the 2008 presidential race. The candidates of both major parties have presented proposals for extending coverage to more people.

There is now a greater tendency among the countries under comparison to strive for centrally coordinated healthcare financing. The approach in countries like Denmark and Norway is for the state to take over financing, whereas countries like the Netherlands and Germany have chosen to increase the mandatory component of health insurance. The proposal of the Swedish Committee of Accountability points in the same direction, though not specifically changing the way health care is financed. Finland is discussing a reduction in the number of healthcare districts (which are in charge of specialist care), as well as change at the local level (responsible for primary care), either by a decrease in the number of local authorities or the establishment of a local federation to manage primary care. Another tendency is to seek greater integration among the various components of health care. Insufficient coordination and continuity, particularly for the elderly, have long been perceived as problems regardless of the overall healthcare model. One strategy for dealing with these problems has been to strengthen the role of primary care physicians in relation to specialist care, sometimes (as in the UK) by assigning more responsibility for the patient's total health to family doctors.

A similar tendency is visible in Sweden – the Vårdval Halland patient choice scheme is one such example.

Three international comparison that include Sweden

This section describes the results of three international comparisons that include Sweden – otherwise the countries under comparison vary. All three are broad-based comparisons that assess the cost-effectiveness of the various healthcare systems and address the issue of cost-effectiveness in one sense or another.

Health Consumer Powerhouse

Health Consumer Powerhouse (HCP) has published three comparisons of EU countries. *The Euro Health Consumer Index (EHCI)* 2007, which compared 29 countries, has attracted a good deal of attention in the Swedish debate, partly because Sweden dropped from fourth to sixth place since the first comparison. We will make a thorough presentation of this comparison.

HCP describes itself as the leading European company when it comes to comparisons and analyses of healthcare systems. One target group is the general public, which comparisons are to help make choices and obtain the power to change healthcare systems. An additional target group consists of governments and other policy makers.

Austria was ranked first in 2007 with 806 out of 1 000 possible points, followed by the Netherlands, France, Switzerland and Germany. Sweden was ranked sixth with 740 points.

The cumulative score is a combination of five subdisciplines (see below). Sweden is the only country that received the highest score on all indicators for the subdiscipline of outcomes and shared first place for the subdisciplines of generosity (how many people are covered by public healthcare systems and how many obtain care) and pharmaceuticals. That which pulled Sweden's cumulative score down to sixth place was the subdiscipline of waiting times, in which it was ranked last of the 29 countries. Sweden was in seventh place with respect to patient rights and information.

Worth noting is that the indicators for the subdiscipline of accessibility are not the same that are included in the Swedish healthcare guarantee. In other words, the Swedish healthcare system could satisfy the guarantee in all respects without affecting HCP's assessment of its accessibility.

Below is a list of the various indicators that make up each sub-discipline.

- *patient rights and information 9 indicators*
  Patients' Rights Law; patient organisations involved in decisionmaking; no-fault malpractice insurance; right to second opinion; access to own medical record; readily accessible register of legit doctors; Electronic Patient Record (EPR) penetration in primary care; provider catalogue with quality ranking; Web or 24/7 telephone healthcare info

- *Waiting times: 5 indicators*
  Family doctor same day service; direct access to specialist care; major non-acute operations; cancer – radiation/chemotherapy; MRI (magnetic resonance imaging) scan examination
- *Outcomes: 5 indicators*
  Heart infarct mortality <28 days after getting to hospital; infant deaths/1 000 live births; cancer, five-year survival rates; avoidable deaths (potential years of life lost per 100 000 citizens); methicillinresistant Staphylococcus aureus (MRSA) infections
- *Generosity of public healthcare systems: 5 indicators*
  Cataract operation rates per 100 000 citizens (age-adjusted); Infant 4-disease vaccination; kidney transplants per million population; is dental care a part of the offering from public healthcare systems
- *Pharmaceuticals: 4 indicators*
  Rx subsidy%; layman-adapted pharmacopoeia; speed of deployment of novel cancer drugs; access to new drugs

A score on a three-point scale was awarded for each of the 28 indicators:

- Three points: Good outcome
- Two points: Intermediary outcome
- One point: Poor outcome

Where the line was drawn between the three scores is not indicated other than that the scores were based on independent assessments depending on the spread for each indicator. Information is generally meagre about how assessments were performed, and it is difficult to get a grasp on how the various countries were judged for a number of the indicators, such as patient organisations involved in decision making or patients' rights law. The surveys referred to are also inadequately described, as well as the interviews with healthcare officials used to qualify official public data with data in questionnaires and interviews.

The various subdisciplines that made up the cumulative index were weighted as follows.

Sub-discipline	Relative weight
Patient rights and information	1.5
Waiting times	2.0
Outcomes	2.0
Generosity of public healthcare systems	1.0
Pharmaceuticals	1.0

According to the report, the weights were arrived at after careful consideration and in dialogue with a panel of experts. But what that consideration consisted of is not presented, such as why generosity in public health care systems, i.e., the percentage of the population covered by the systems and the number that obtain health care, is given only half as much weight as waiting times.

For each of the five sub-disciplines, below is a presentation of the indicators and how they were defined. To clarify Sweden's position, the indicators are presented separately with Sweden in a column of its own.

Patient rights and information

	Indicator	Definition	3 points	2 points	1 point	Sweden
1	Patients' rights law	Is national healthcare legislation explicitly expressed in terms of patients' rights?	Yes	Various kinds of patient charters or similar bylaws	No	1
2	Patient organisations involved in decision making?		Yes, statutory	Yes, by common practice in advisory capacity	No, not compulsory or generally done in practice	2
3	No-fault malpractice insurance	Can patients get compensation with the assistance of the judicial system in proving that medical staff made mistakes?	Yes	Fair, > 25% invalidity covered by the state	No	3
4	Right to second opinion		Yes	Yes, but difficult to access due to bad information, bureaucracy or doctor negativism	No	2
5	Access to own medical record	Can patients read their own medical records?	Yes	Yes, restricted or with intermediary	No	3
6	Readily accessible register of legit doctors	Can the public readily access the info: "Is doctor X a bona fide specialist?"	Yes	Yes, but awkward, costly or not frequently updated	No	1
7	Electric Patient Record (EPR) penetration in primary care	What percentage of GPs use EPRs?	> 80%	80%–50%	< 50%	3
8	Provider catalogue with quality ranking	"Dr. Foster" in the UK remains the standard European qualification for a "Yes" (3 points). The "750 best clinics" published by LaPointe in France would warrant 2 points	Yes	"Not really," but nice attempts under way	No	1
9	Web or 24/7 telephone healthcare information	Information which can help a patient take decisions of the nature: "After consulting the service, I will take a paracetamol and wait and see" or "I will hurry to the A&E department of the nearest hospital"	Yes	Yes, but not generally available	No	2

Accessibility

	Indicator	Definition	3 points	2 points	1 point	Sweden
1	Family doctor same day service	Can I count on seeing my primary care doctor today?	Yes	Yes, but not quite fulfilled	No	1
2	Direct access to specialist care	Without referral from family doctor (GP)	Yes	Not really, but quite often in reality	No	1
3	Major non-acute operations	A "basket" of coronary bypass/PTCA and hip/knee joint (values must be verified for all types of operations)	90% < 90 days	50-90% < 90 days	> 50% > 90 days	1
4	Cancer; radiation/chemotherapy	Time to get radiation/chemotherapy after treatment decision	90% < 21 days	50-90% < 21 days	> 50% > 21 days	2
5	MRI (magnetic resonance imaging) scan examination	Time	Typically < 7 days	Typically < 21 days	Typically > 21 days	1

Outcomes

	Indicator	Definition	3 points	2 points	1 point	Sweden
1	Heart infarct mortality <28 days after getting to hospital		< 18%	< 25%	> 25%	3
2	Infant deaths /1 000 live births		< 4	< 6	> 6	3
3	Cancer 5-year survival rates	All cancers except skin	> 60%	50–60%	< 50%	3
4	Avoidable deaths – potential years of life lost /100 000		< 3 500	3 500–4 500	> 4 500	3
5	Methicillinresistant Staphylococcus aureus (MRSA) infections		< 5%	< 20%	> 20%	3

Generosity of the public healthcare system

	Indicator	Definition	3 points	2 points	1 point	Sweden
1	Cataract operation rates per 100 000 citizens (age-adjusted)		> 700	400–700	< 400	3
2	Infant 4-disease	vaccination%	> 97%	92–97%	< 92%	3
3	Kidney transplants per million population	Living and deceased donors	> 40	40–30	< 30	3
4	Is dental care a part of the offering from public healthcare systems?	Public spend on dental care as% of total public healthcare spend	> 9%	9–5%	< 5%	2

Pharmaceuticals

	Indicator	Definition	3 points	2 points	1 point	Sweden
1	Rx subsidy%		> 90%	60–90%	< 60%	2
2	Layman-adapted pharmacopoeia?	Is there an adapted pharmacopeia for persons who are non-expert in healthcare readily accessible by the public (www or widely available)?	Yes	Yes, but not really easily accessible or frequently consulted	No	3
3	Speed of deployment of novel cancer drugs	How quickly are new cancer drugs made available through public health care?	Quicker than EU average	Close to EU average	Slower than EU average	2
4	Access to new drugs	Period between registration and inclusion of drugs in subsidy system	< 150 days	< 300 days	> 300 days	3

The Conference Board of Canada

The Conference Board of Canada (CBC) is an independent non-profit organisation that obtains assignments from both the public and private sector. The CBC seeks to generate knowledge about economic, policy and organisational development trends in various areas, including health care.

A comparison published by the CBC in 2004 ranked the healthcare systems of 24 countries on the basis of 24 indicators. Switzerland was ranked first and Sweden second. Spain, France, Italy and Germany shared third place, while the United States came in second to last, followed by Greece.

The 2007 report covers not only health care, but a number of other areas, including the economy, innovation, environment and education. As shown in the following table, which lists healthcare ranks and scores, the selection of countries was somewhat different than 2004. Switzerland was still ranked first, whereas Japan, one of the new countries included in the comparison, was ranked second. Sweden was ranked third. The United States was still second to last, followed this time by Ireland.

The CBC uses traditional indicators based on results and cost-effectiveness.

Ranking	Country	Score
1	Switzerland	A
2	Japan	A
3	Sweden	A
4	France	A
5	Australia	A
6	Norway	A
7	Italy	A
8	Canada	B
9	The Netherlands	B
10	Germany	B
11	Finland	C
12	Austria	C
13	UK	C
14	Belgium	D
15	Denmark	D
16	United States	D
17	Ireland	D

Below is a description of the various indicators.

	Indicators			
Output	Life expectancy for women			
	Life expectancy for men			
	Perceived health status			
	Premature deaths			
	Deaths due to cancer			
	Deaths due to circulatory disease			
	Deaths due to respiratory disease			
	Deaths due to heart disease			
	Deaths due to diabetes			
	Deaths due to flu and pneumonia			
	Infant mortality			
	Frequency of suicide			
	Health status	**Resources**	**Use**	**Non-medical determinants**
Input	Injuries due to traffic accidents	Practicing doctors	Vaccination against diphtheria, tetanus and pertussis	Alcohol consumption
	Low birth weight	Practicing general practitioners	Vaccination against measles	Tobacco consumption
		Practicing specialists	Vaccination of 65+ against flu	Overweight or obesity
		Practicing nurses	Mammography screening	
		Practicing pharmacists	Screening for cervical cancer	
		MRI units		
		Radiotherapy units		
Policy	Percentage of population with full access to health care			
	Increase in costs for health care – public			
	Increase in costs for health care – private			

Sweden's scores on the various results indicators appear in the following table.

Indicators	Score
Life expectancy for women	C
Life expectancy for men	A
Perceived health status	B
Premature deaths	A
Deaths due to cancer	A
Deaths due to circulatory disease	C
Deaths due to respiratory disease	A
Deaths due to heart disease	D
Deaths due to diabetes	B
Deaths due to flu and pneumonia	B
Infant mortality	A
Frequency of suicide	B

The Fraser Institute

The motto on the website of the Fraser Institute (FI) is "a free and prosperous world through choice, markets and responsibility." It is an independent Canadian research institute financed by contributions from individuals, businesses and foundations. The FI measures and studies the impact of competition and government intervention on individuals and society.

The FI published an international comparison of 27 countries in 2005. The purpose was to provide an overall assessment of the various healthcare systems and their cost-effectiveness. The cumulative ranking put Australia in first place and Sweden in second place.

The report focused on how well Canada stacked up against other countries.

- How much does Canada spend on health care compared to other countries?
- What countries other than Canada do not have cost sharing?
- Does Canada have too many doctors and should Canada put its doctors on salary?
- Do other countries follow Canada's model of monopolistic public provision of health insurance?
- Are Canadians getting their money's worth from Canada's expensive healthcare programme?

Most of the report was a contribution to the Canadian debate about its healthcare system, and the thrust of it was critical of the current system. Below are some of the indicators on which the report is based (Sweden's rank in parentheses).

- Healthy life expectancy/life expectancy (2)
- Infant mortality (2)
- Perinatal mortality (8)

Mortality closely related to the cost-effectiveness of health care:

- Mortality amenable to health care (5)
- Potential years of life lost (2)
- Breast cancer mortality (1)
- Colorectal cancer, combined mortality (9)
- Cumulative ranking (2)

A comparison of cost-effectiveness in 17 countries – Sweden compared with the other EU 15 countries, Norway and the United States.

This report compares the healthcare systems of different countries based on indicators of results and resources. Indicators of accessibility and patient experience are not included given that such data are available for a few countries only. As opposed to our 2005 report, we have created cumulative indexes for both results and resource consumption. Combining these two indexes generates a cost-effectiveness index of the various healthcare systems.

As seen in the other international comparisons presented above, cumulative indexes are common. The advantage of creating indexes is that an overall assessment is obtained. Indexes are generally employed to permit an overview when many different indicators are used. It is a way to summarise and describe complex phenomena and correlations. Indexes also have disadvantages, above all that they may conceal the complexity of results. Thus, the total ranking may be emphasised too much and ignore the complexity of the underlying results. Even that which is ranked first may have poor results in particular areas.

Indexes are also sensitive to the choice of method, such as which one is used to scale indicators and how missing values are handled. Moreover, results are affected by how various indicators are weighted. For that reason, it is important to perform various kinds of sensitivity analyses in order to assess how alternative weightings influence the results. This section concludes with such a sensitivity analysis.

The indexes presented in this section proceed from the individual indicators described in the appendix. The indicators that are part of a particular index are marked with an asterisk. The indexes are essentially based on the average (after standardisation) of the individual indicators. If a country has good results for a number of indicators in an area, it does well in that particular area. The methodology for each index is presented in a separate note. For a more in-depth description of how indexes are created and the opportunities and risks they entail, refer to Witell and Elg (2008).

The countries included in the comparison are Austria, Belgium, Denmark, Finland, France, Greece, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, the UK and the United States. The resource consumption index reports all of the countries, but Belgium is not part of the results index given that the available statistics are not good enough.

Resource consumption index

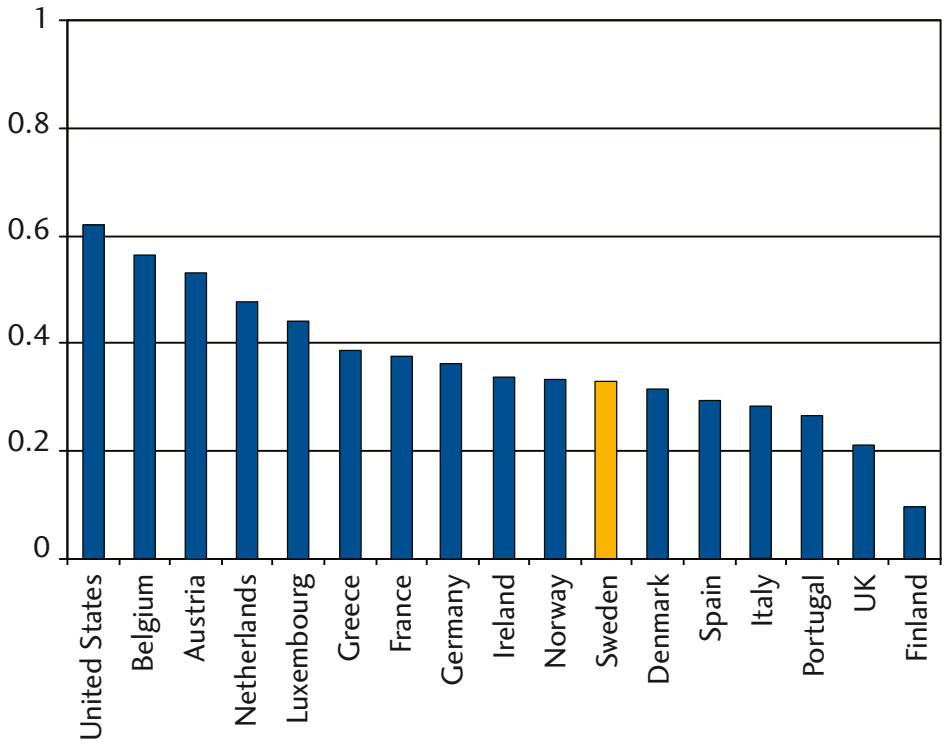
The resource consumption index consists of four indicators, as shown below.

Resource consumption indicators

Indicator	Unit of measurement	Source	Desired direction
Per capita cost of health care in 2005, with purchasing power taken into consideration. U.S. dollars	Cost	OECD 2007	Minimise
Health care as a percentage of GDP, 2005	Percentage	OECD 2007	Minimise
Doctors per 1 000 citizens, 2005	Number	OECD 2007	Minimise
Nurses per 1 000 citizens, 2005	Number	OECD 2007	Minimise

The index for resource consumption is shown below. The method for creating the index is based on first scaling all the indicators to [0, 1] and then calculating the average. Thus, the indicators are all weighted the same.[1]

Resource consumption index



1. The index is designed according to the rescaling method. According to the method, all variables are assigned a value from 0 to 1. Furthermore, there is a complete dataset, i.e., no observations are missing for any country.

The country in which health care consumes the most resources is the United States, followed by Belgium, Austria and the Netherlands. The "cost of health care" and "percentage of GDP" indicators are primarily responsible for the position of the United States. Belgium has high values for all indicators, whereas Austria and the Netherlands exhibit relatively large variations among the various indicators.

The countries in which health care consumes the fewest resources are Finland, the UK, Portugal, Italy and Spain. All indicators for Finland except for "nurses per 1 000 citizens" show very low resource consumption. Sweden has relatively low costs for health care.

Results index

The results index contains 18 indicators.

Results indicators

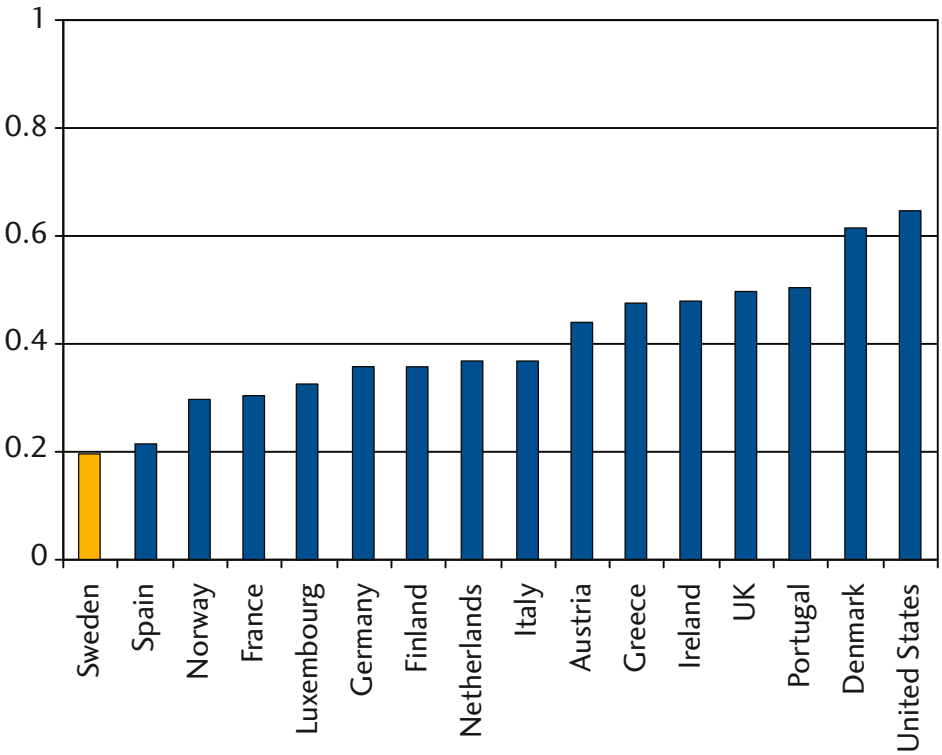
Indicator	Unit of measurement	Source	Desired direction
Life expectancy of a boy born in 2005	Year	OECD 2007	Maximise
Life expectancy of a girl born in 2005	Year	OECD 2007	Maximise
Premature deaths younger than 70 per 100 000 citizens in 2004, women	Number	OECD 2007	Minimise
Premature deaths younger than 70 per 100 000 citizens in 2004, men	Number	OECD 2007	Minimise
Avoidable deaths in 2004, age-standardised	Percentage	OECD 2007	Minimise
Infant deaths in 2005 per 1 000 live births	Percentage	OECD 2007	Minimise
Number of deaths from cancer per 100 000 citizens in 2004, women	Number	OECD 2007	Minimise
Number of deaths from cancer per 100 000 citizens in 2004, men	Number	OECD 2007	Minimise
Number of deaths from lung cancer per 100 000 citizens in 2004, women	Number	OECD 2007	Minimise
Number of deaths from lung cancer per 100 000 citizens in 2004, men	Number	OECD 2007	Minimise
Number of deaths from breast cancer per 100 000 citizens in 2004	Number	OECD 2007	Minimise
Number of deaths from ischaemic heart disease per 100 000 citizens in 2004, women	Number	OECD 2007	Minimise
Number of deaths from ischaemic heart disease per 100 000 citizens in 2004, men	Number	OECD 2007	Minimise
Number of deaths from stroke per 100 000 citizens in 2004, women	Number	OECD; Health at Glance 2007	Minimise
Number of deaths from stroke per 100 000 citizens in 2004, men	Number	OECD; Health at Glance 2007	Minimise
Number of children vaccinated against measles in 2005	Percentage	OECD 2007	Maximise
Number of children vaccinated against diphtheria, tetanus or pertussis in 2005	Percentage	OECD 2007	Maximise
Sales of antibiotics in outpatient care, 2003	Number	ESAC*	Minimise

*European Surveillance of Antimicrobial Consumption

The results index is shown below. The method for creating the results index is based on the same procedure as the resource consumption index. All indicators are first scaled to [0, 1], after which their averages are calculated. A number of values are missing for some of the indicators. Depending on what type of values are missing and whether the cause is random or systematic, different substitution techniques (imputation and mean substitution) have been used (see Witell and Elg, 2008).

So much data was missing for Belgium that no index could be created.

Results index



Sweden, Spain, Norway and France score best on the results index. The United States, Denmark, Portugal and the UK come in last. Sweden does well on most of the indicators. Key areas in which Sweden performs comparatively poorly are the number of women who die of cancer per 100 000 and the number of women who die of lung cancer per 100 000. That is also true of mortality from stroke and ischaemic heart disease. Nevertheless, Sweden scores well on the index as a whole. As opposed to Sweden, 2nd place Spain is relatively weak when it comes to deaths from cancer and lung cancer in men.

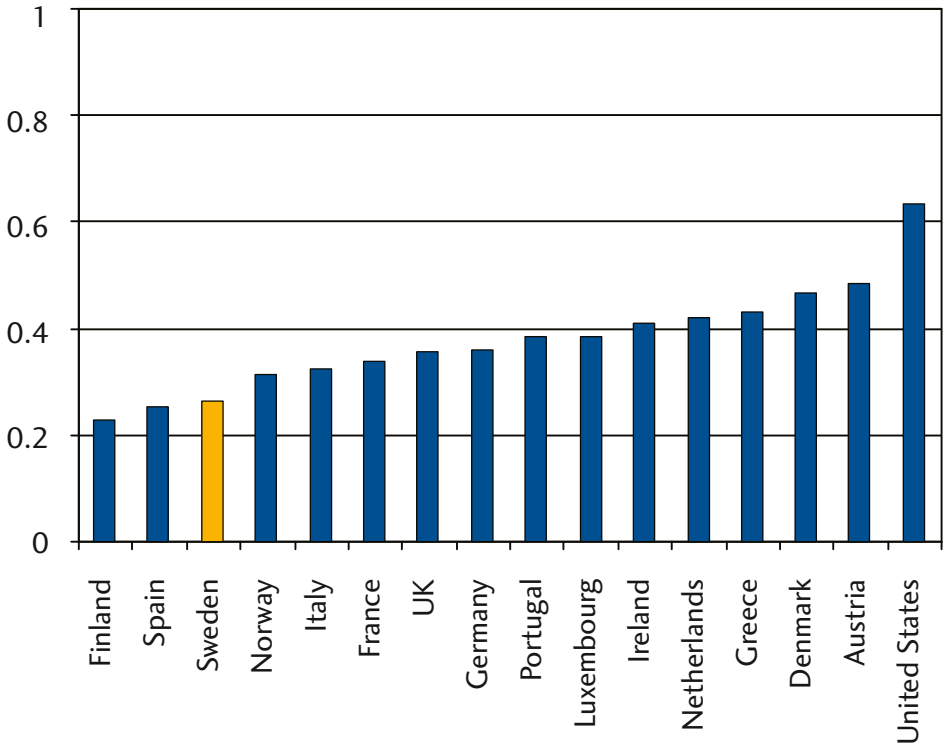
Cost-effectiveness index

This index was created in order to assess cost-effectiveness at an overall level. The index is based on the indexes for resource consumption and results. Results are weighed against resource consumption, and the countries that produce good results at low resource consumption are ranked best. Finland has the most cost-effective health care according to this index. Spain is ranked second and Sweden third. Overall, the United States provides the least cost-effective health care.

Finland and Sweden, two of the three countries at the top, have healthcare systems that are tax-financed at the regional level. Spain, the third country, has tax financing at the national level combined with regional responsibility for management and organisation.

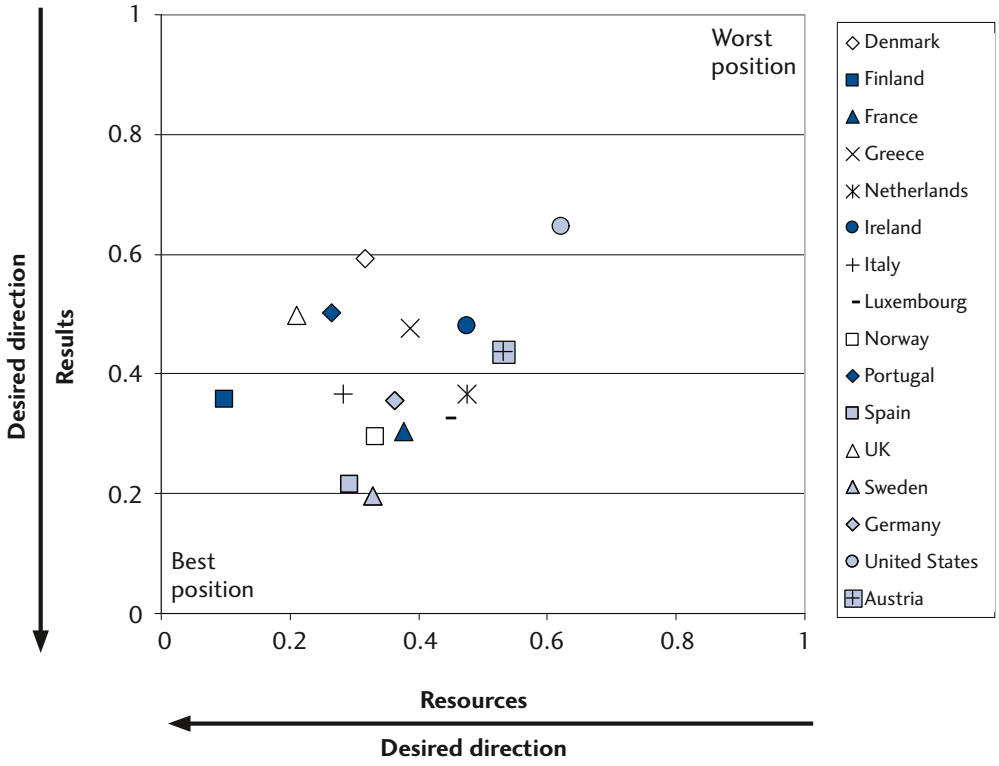
All three countries also have relatively few beds per citizen. Sweden and Spain are the lowest in that regard. That is a sign of the ability to restructure and introduce new medical technologies and pharmaceuticals, which improves cost-effectiveness.

Cost-effectiveness index



To illustrate the ingredients of cost-effectiveness, the indexes for resource consumption and results are juxtaposed in a two-dimensional matrix. The ideal position is near point [0,0], i.e., low resource consumption and good results. The worst position is near point [1, 1], i.e., high resource consumption and poor results.

Cost-effectiveness matrix



The matrix shows that the United States is nearest the worst position, i.e., high resource consumption and poor results. Finland is at the other extreme with the lowest resource consumption and relatively good results. Sweden and Spain are close to each other with good results and medium resource consumption. Norway, France, Germany and Italy also have relatively good positions on the cost-effectiveness matrix.

Sensitivity analysis

Following is a presentation of the various sensitivity analyses that we performed by varying the weights of the indicators in the results index, or varying the weights of results or resource consumption in the cost-effectiveness index.

For the results index, we examined the impact of changing the weight of broader and narrower indicators as follows.

Broader indicators:

- Life expectancy of a boy born in 2005
- Life expectancy of a girl born in 2005
- Premature deaths younger than 70 per 100 000 citizens in 2004, women
- Premature deaths younger than 70 per 100 000 citizens in 2004, men
- Avoidable deaths in 2004, age-standardised
- Infant deaths in 2005 per 1 000 live births

Narrower indicators:

- Number of deaths from cancer per 100 000 citizens in 2004, women
- Number of deaths from cancer per 100 000 citizens in 2004, men
- Number of deaths from lung cancer per 100 000 citizens in 2004, women
- Number of deaths from lung cancer per 100 000 citizens in 2004, men
- Number of deaths from breast cancer per 100 000 citizens in 2004
- Number of deaths from ischaemic heart disease per 100 000 citizens in 2004, women
- Number of deaths from ischaemic heart disease per 100 000 citizens in 2004, men
- Number of deaths from stroke per 100 000 citizens in 2004, women
- Number of deaths from stroke per 100 000 citizens in 2004, men
- Number of children vaccinated against measles in 2005
- Number of children vaccinated against diphtheria, tetanus or pertussis in 2005
- Sales of antibiotics in outpatient care, 2003

We studied the following weighting alternatives:

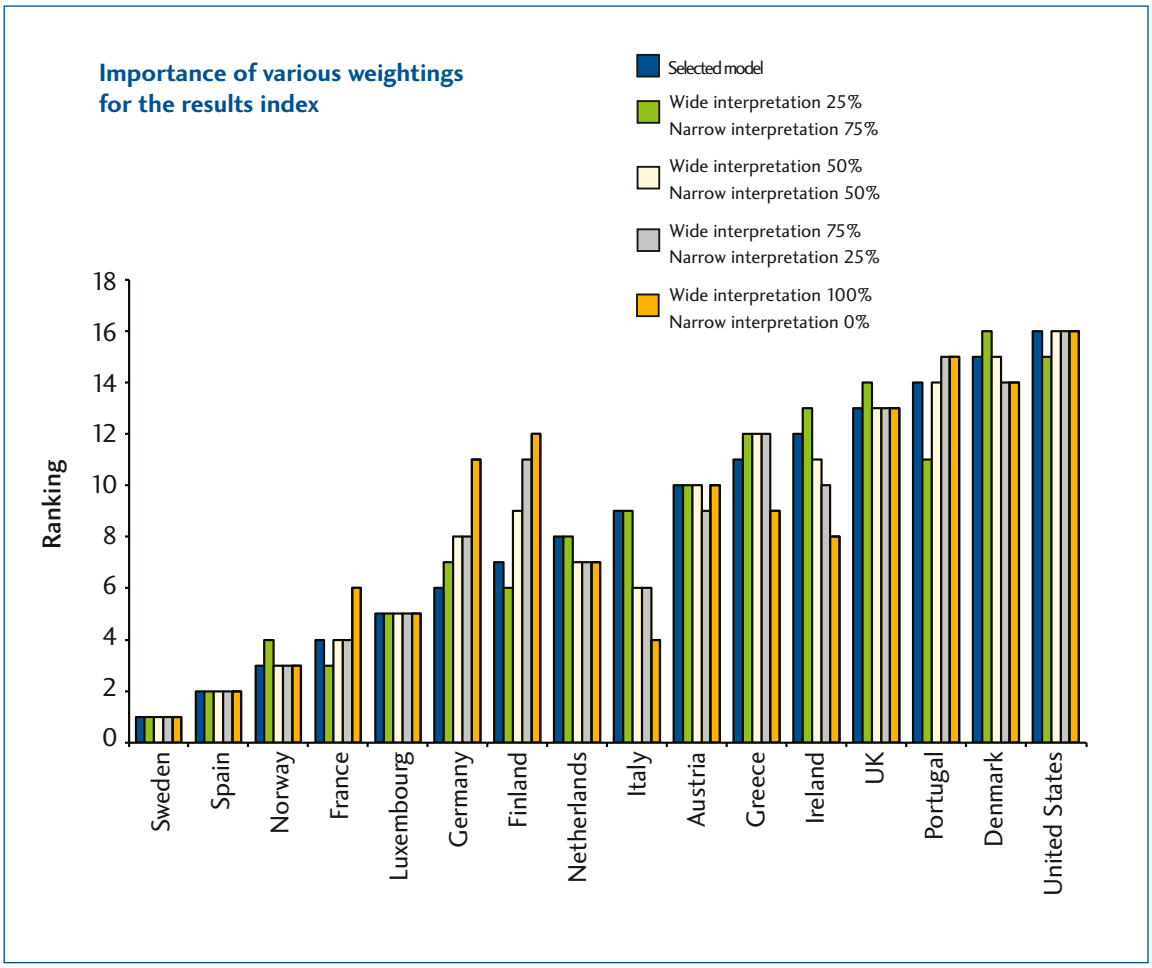
1) broader indicators 25%, narrower indicators 75%

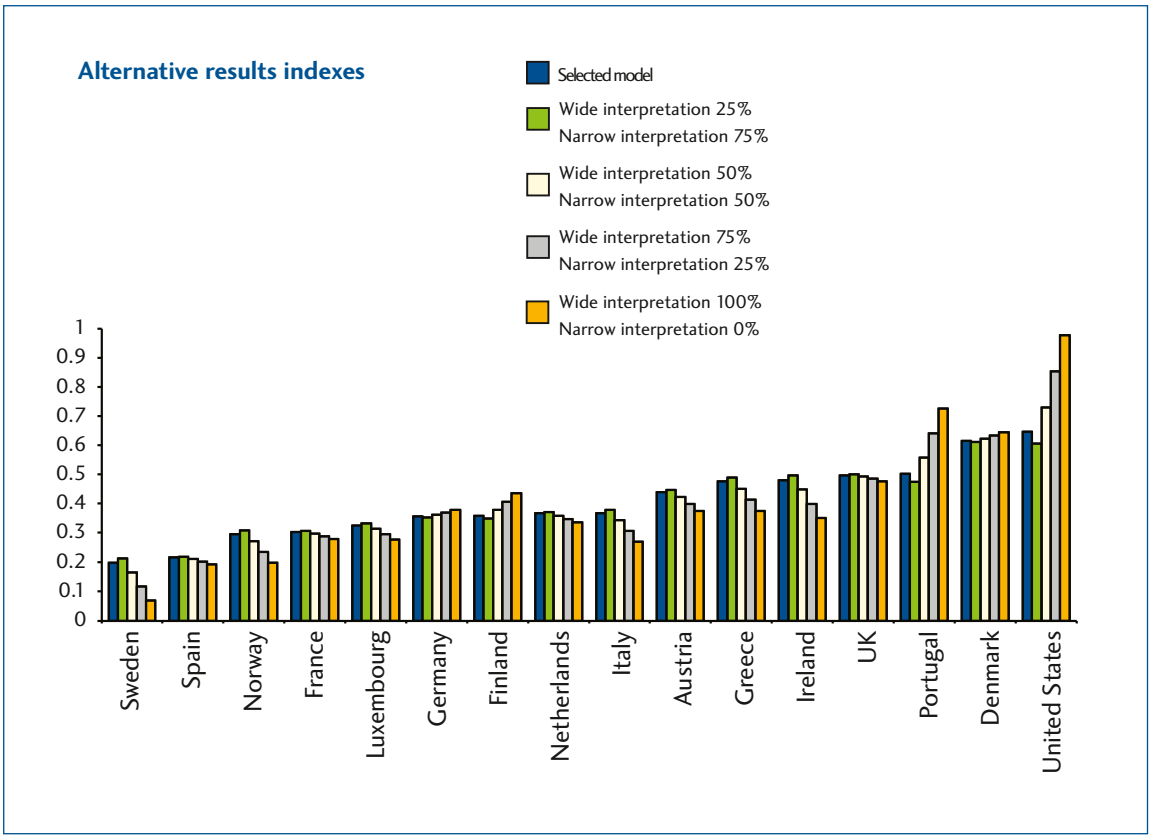
2) broader indicators 50%, narrower indicators 50%

3) broader indicators 75%, narrower indicators 25%

4) broader indicators 100%, narrower indicators 0%

The various weightings for the broader and narrower indicators did not lead to very large differences for the great majority of countries (such as France, Luxembourg, Sweden, Spain, the Netherlands, Austria and Denmark). But Italy and Ireland have better positions when the broader indicators are weighted up, while countries like Germany and Finland have poorer positions. Regardless of how we weighted the indicators, Sweden was toward the top of the results index.





Generally speaking, the sensitivity analysis shows that the countries with the best and worst results retained their position regardless of how the various indicators were weighted.

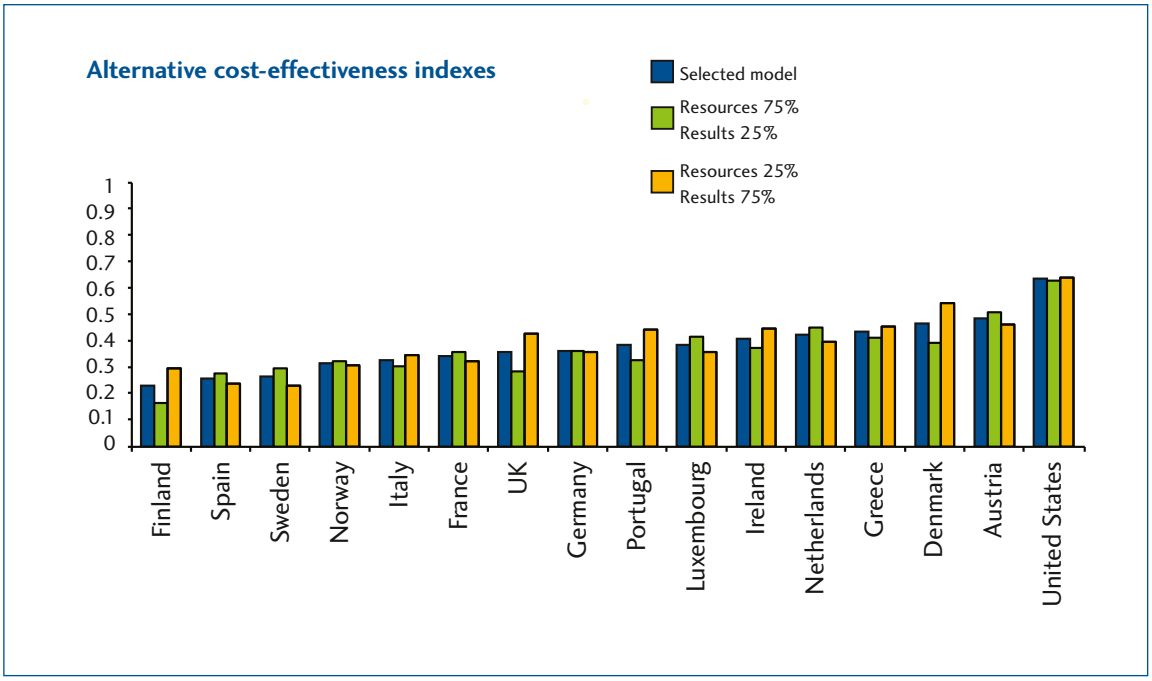
The diagram shows that Germany and Finland's positions are lower when the broader indicators are weighted up. On the other hand, Italy has a higher position when the broader indicators are weighted up. Ireland has a similar pattern.

Cost-effectiveness index

For the cost-effectiveness index, we studied the impact of changing the weight of results or resource consumption/cost as follows.

1) 25% results and 75% resource consumption/cost

2) 75% results and 25% resource consumption/cost



The diagram shows that the positions of some countries are affected by weighting. For example, Finland has a somewhat poorer position when the results indicators are weighted up. Nevertheless, it retains its position toward the top. The UK, Portugal and Denmark also negatively affected when the results indicator is weighted up. However, Sweden's position improves when the results indicators are given greater weight.

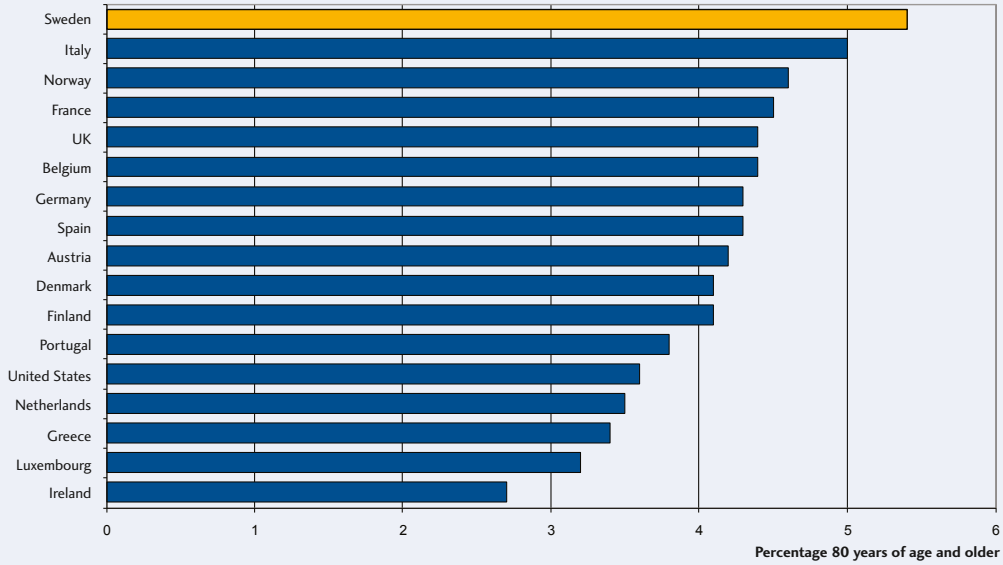
Because cost-effectiveness may also be regarded as results divided by quantity of resources, the sensitivity analysis also included an index based on that approach. The approach generally showed the same relative positions as above: Finland had the most cost-effective health care, followed by Spain and Sweden. Denmark, Austria and the United States had the least cost-effective health care.

Appendix

DEMOGRAPHICS

The population of the EU countries is aging, and the fastest growth is among people over 80. At 5.4 percent, Sweden has the largest percentage of people age 80 or older, followed by Italy with 5 percent. At 2.7 percent, Ireland has the lowest percentage of people age 80 or older.

Population age 80 and older as a percentage of total population, 2005

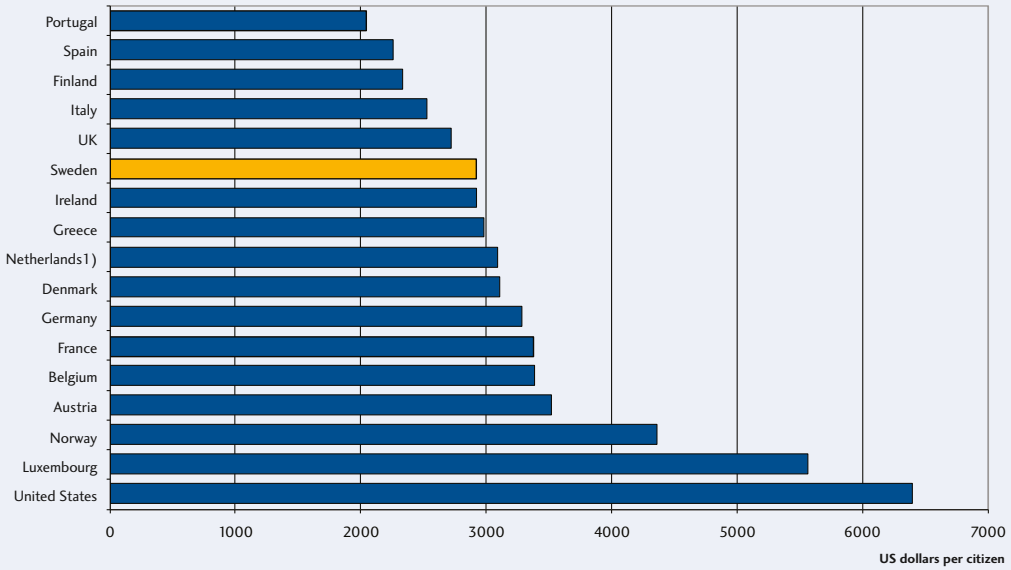


Source: Eurostat and U.S Census Bureau 2007

COSTS AND COST TRENDS

The most common way of looking at costs in international comparisons is to proceed from the dollar cost per citizen while taking into consideration purchasing power in each country. Based on that calculation, the per capita cost for health care in 2005 was three times as much in the United States (6 401 dollars) as Portugal (2 041 dollars). Among the Scandinavian countries, healthcare costs per citizen were highest in Norway (4 364 dollars), followed by Denmark (3 108 dollars) and Sweden (2 918 dollars), while Finland was lowest (2 331 dollars). Of the 17 countries compared in this report, 11 had higher costs than Sweden.
Healthcare costs rose in all the countries compared in this report. Costs increased by 77 percent in Sweden. At 192 percent, Luxembourg had the largest increase from 1995 to 2005, while Germany's costs were up by only 58 percent for the same period.

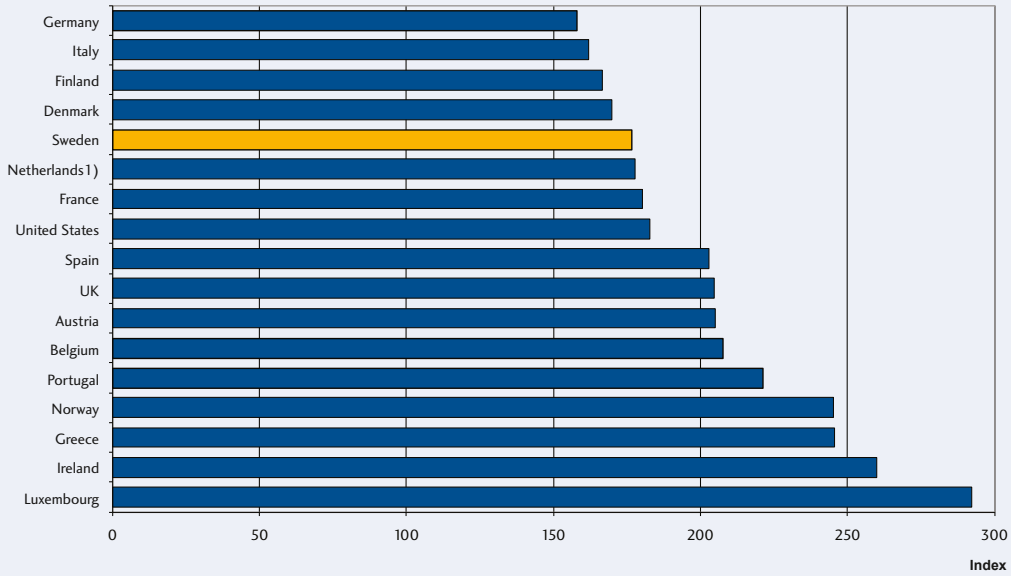
Per capita cost for health care, 2005
Purchasing power taken into consideration. US-dollars*



Source: OECD 2007 [1)]*=2004*

**= The indicator is part of the resource consumption index*

Increase in per capita cost for health care, 1995–2005
Purchasing power taken into consideration. Index 1995=100



Source: OECD 2007 [1)]*=1994-2004*

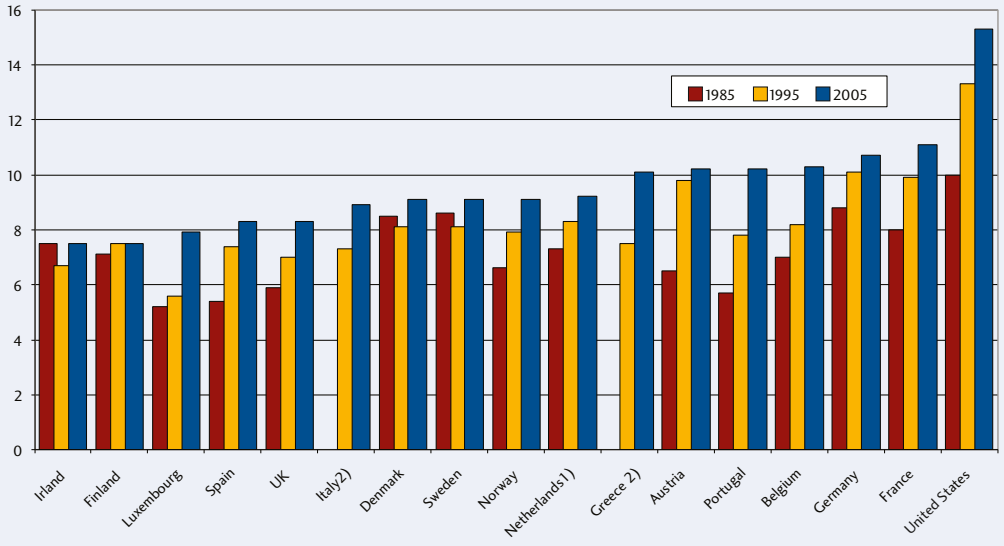
Healthcare costs as a percentage of GDP are one way of describing these trends.

Healthcare costs rose as a percentage of GDP from 2000 to 2005 in all the countries compared. The largest increases were in Luxembourg (2.5 percentage points) and the United States (2.0 percentage points), while the smallest increase was in Greece (0.2 percentage points). Sweden's healthcare costs rose by 0.7 percentage points from 8.4 percent of GDP in 2000 to 9.1 percent in 2005.

Healthcare costs as a percentage of GDP in 2005 were lowest in Ireland and Finland (7.5 percent) and highest in the United States (15.3 percent). Of the 17

countries compared in this report, 7 had healthcare costs with a lower percentage of GDP than Sweden.

Health care as a percentage of GDP, 1985, 1995 and 2005*



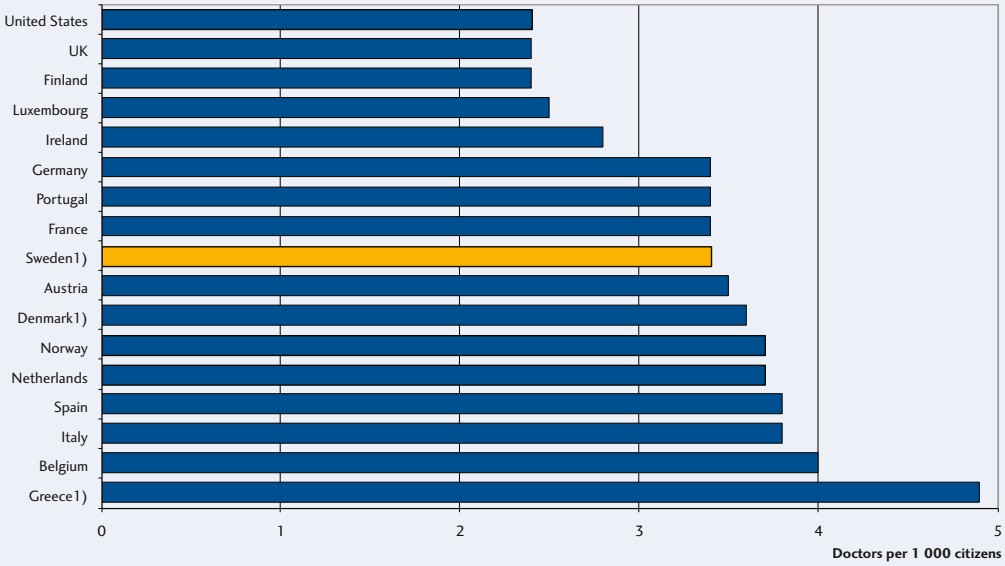
Source OECD 2007 [1] = 2004 [2] = no data available for 1985

**= The indicator is part of the resource consumption index*

PERSONNEL RESOURCES

Sweden had 3.4 doctors per 1 000 citizens, just below average. The United States was lowest with 2.4 doctors per 1 000 citizens, and Greece (4.9) and Belgium (4) were highest.

Doctors per 1 000 citizens, 2005*

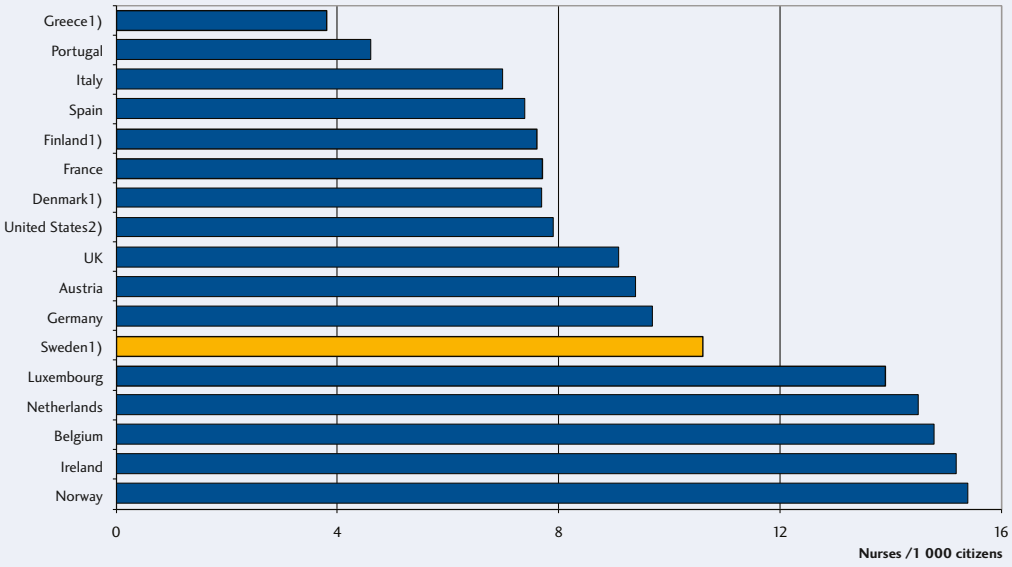


Source: OECD 2007 [1]=2004

**= The indicator is part of the resource consumption index*

At 10.6 nurses per 1 000 citizens, Sweden came in sixth place. Five countries had more and 11 countries had fewer nurses per 1 000 citizens.

Nurses per 1 000 citizens, 2005*



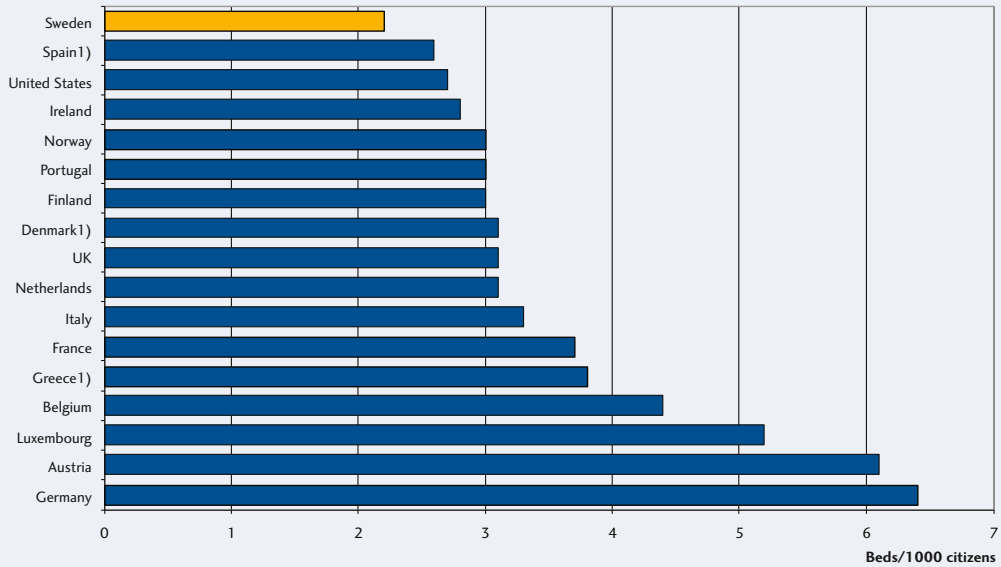
Source: OECD 2007 1)=2004 2)=2002

**= The indicator is part of the resource consumption index*

STRUCTURE OF HEALTHCARE SYSTEMS

Sweden and Spain had the fewest beds per 1 000 citizens in short-term health care with 2.2 and 2.6 respectively. Germany had 6.4 beds per 1 000 citizens.

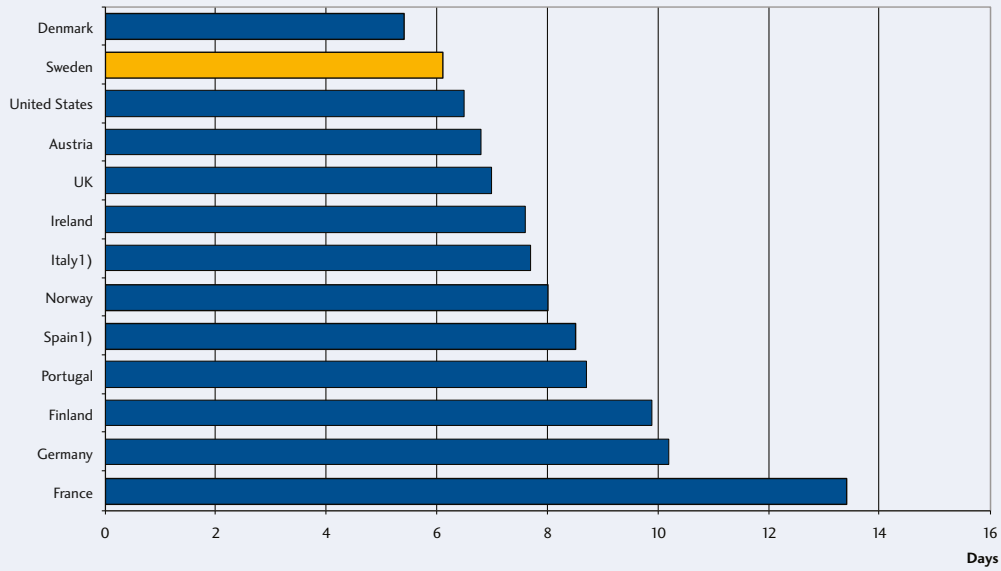
Beds per 1 000 citizens, 2005



Source: OECD 2007 1)=2004

With shorter and shorter periods of medical care, the number of beds has decreased. As indicated by figure below, Denmark and Sweden had the shortest periods of medical care.

Average period of medical care, 2005. Short-term care

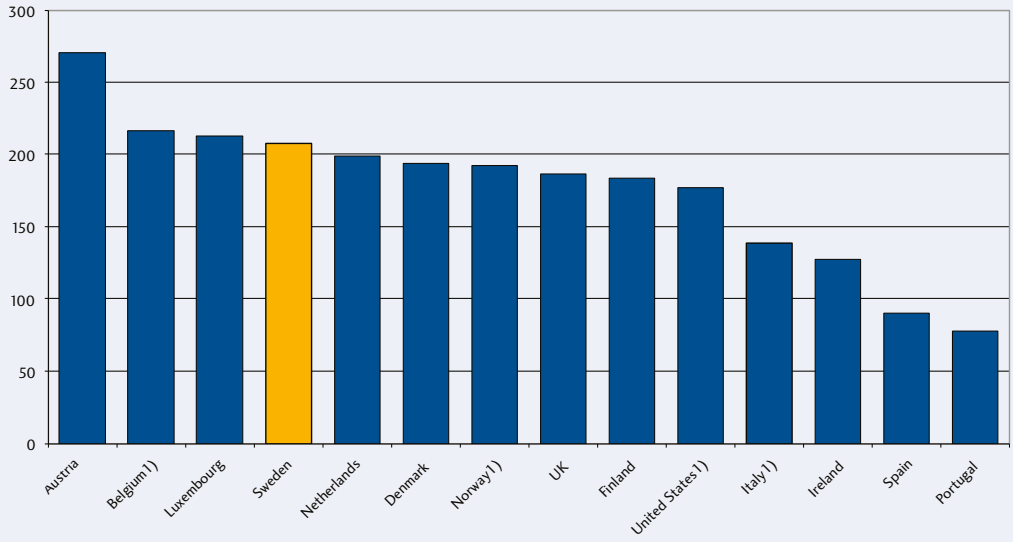


Source: OECD 2007 1)=2004

ACCESS TO VARIOUS MEDICAL INTERVENTIONS

More than 200 hip operations per 100 000 citizens were performed in Sweden in 2005, putting it in fourth place behind Austria, Belgium and Luxembourg. Portugal and Spain were lowest with fewer than 100 operations per 100 000 citizens.

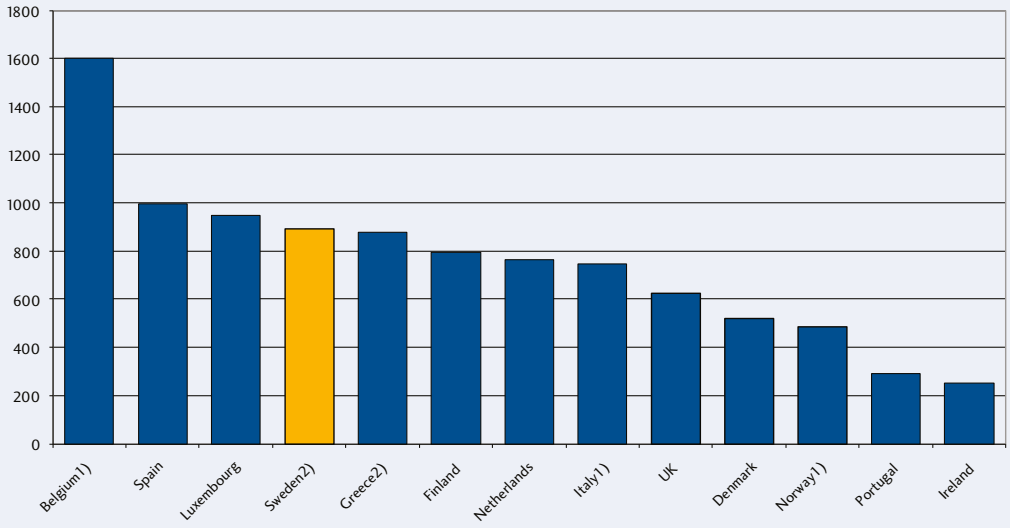
Antal höftledsoperationer per 100 000 invånare 2005



Source: OECD 2007 1)=2004

More than 895 cataract operations per 100 000 citizens were performed in Sweden in 2005, putting it in fourth place behind Belgium, Spain and Luxembourg. Ireland and Portugal were considerably lower with just over 250 and 288 operations respectively per 100 000 citizens.

Number of cataract operations per 100 000 citizens, 2005

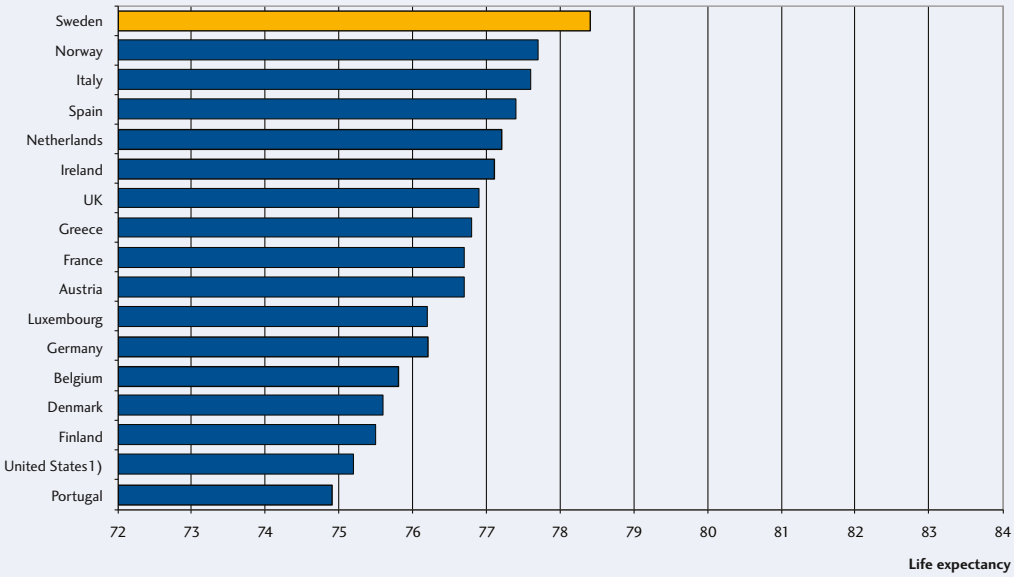


Source: OECD 2007 1)=2004 2)=2003

RESULTS

At 78.4, Swedish men had the highest life expectancy in 2005. At 84, Spanish and French women had the highest life expectancy, as opposed to 82.8 for Swedish women. The difference between women and men was least in the UK (4.2), followed by Sweden and the Netherlands (4.4). France had the biggest difference (7.1).

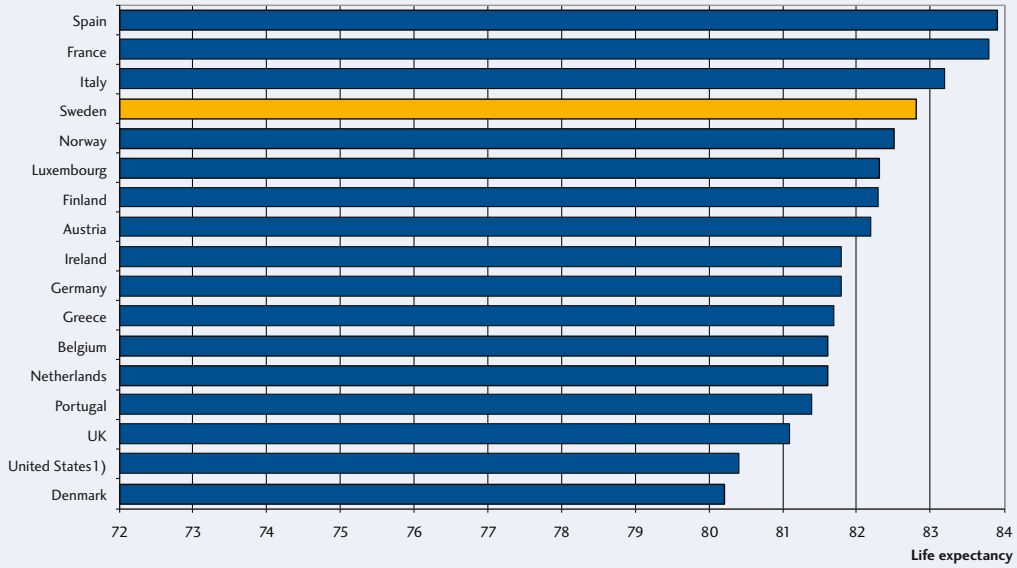
Life expectancy of a boy born in 2005*



Source: OECD 2007 1)=2004

**= The indicator is part of the results index*

Life expectancy of a girl born in 2005*

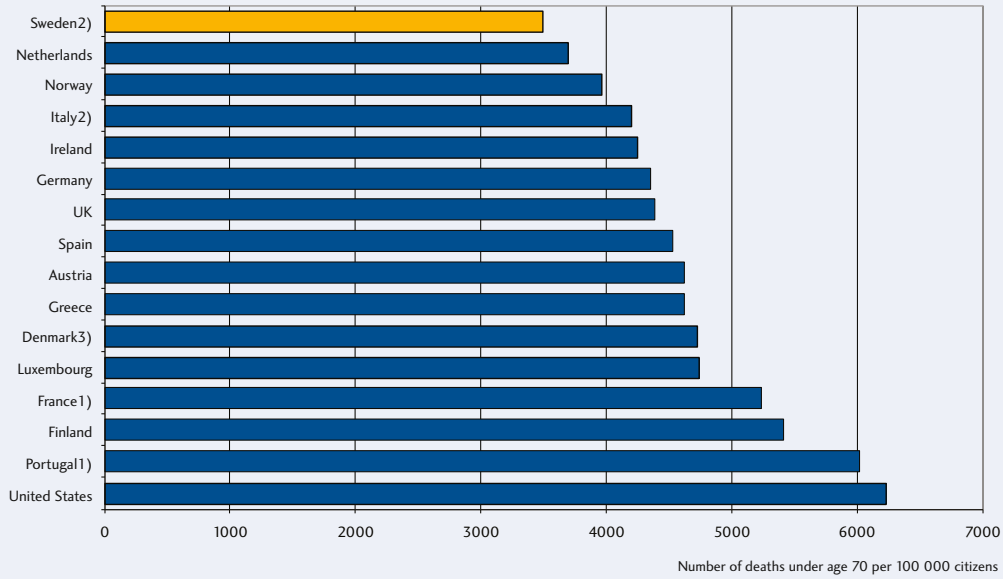


Source: OECD 2007 1)=2004

**= The indicator is part of the results index*

Premature death is another frequently used indicator of ill-health. All deaths before age 70 are regarded as premature. That measure is not wholly correlated with remaining life expectancy. Swedish men have the lowest premature deaths per 100 000 citizens, while Swedish women are in third place among the 16 countries that reported to the OECD.

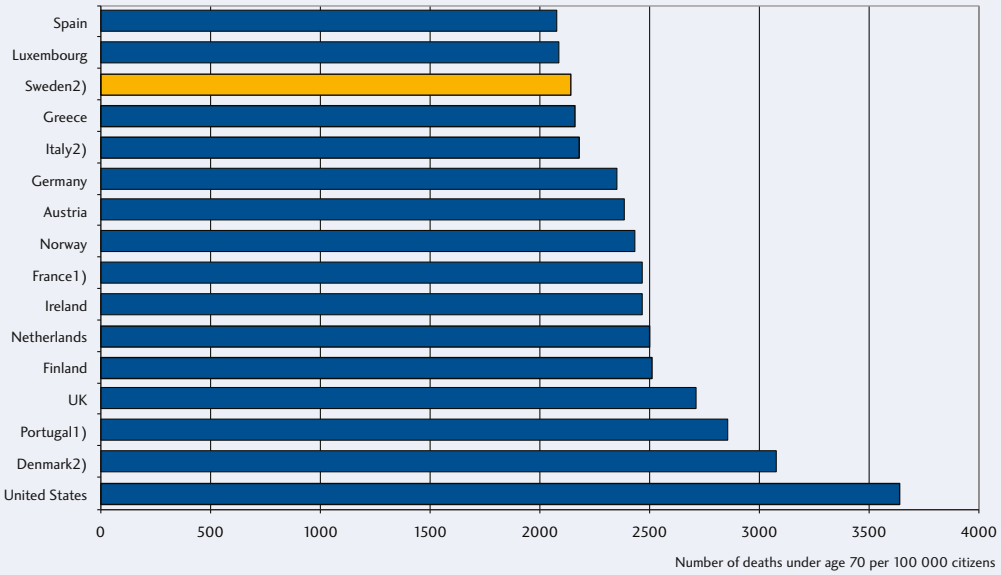
Premature death below age 70 in 2004, men*



Source: OECD 2007 1)=2003 2)=2002

**= The indicator is part of the results index*

Premature death below age 70 in 2004, women*



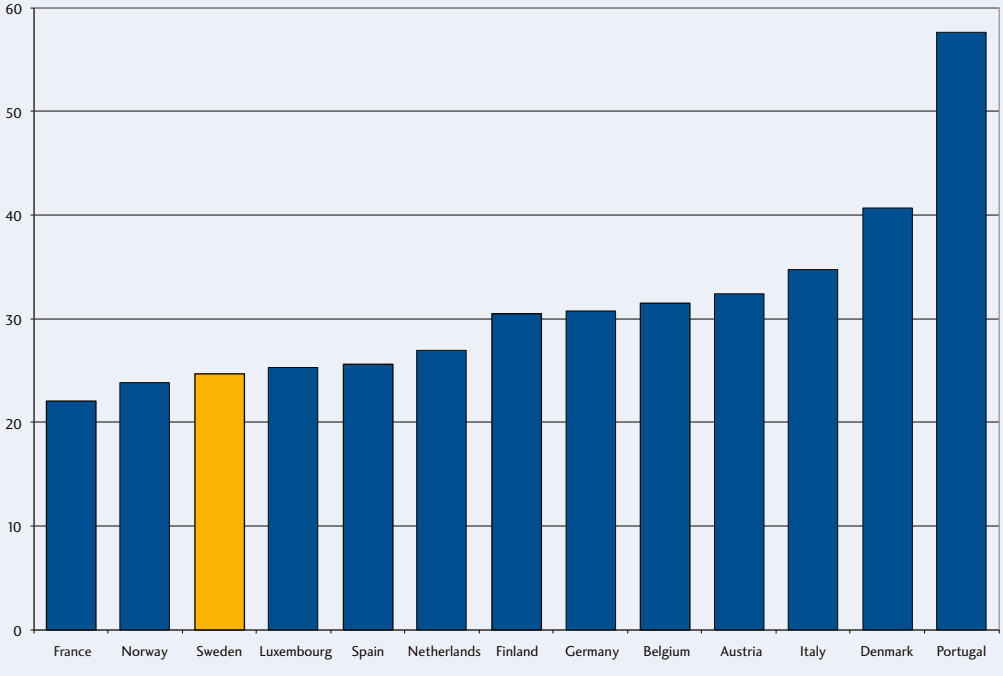
Source: OECD 2007 [1]=2003 [2]=2002

**= The indicator is part of the results index*

Avoidable deaths are an indicator that focus most on what healthcare systems can accomplish by means of preventive and direct interventions.

The figure below, which presents age-standardised avoidable deaths, shows that Sweden was in third place behind France and Norway.

Avoidable deaths in 2004, age-standardised*

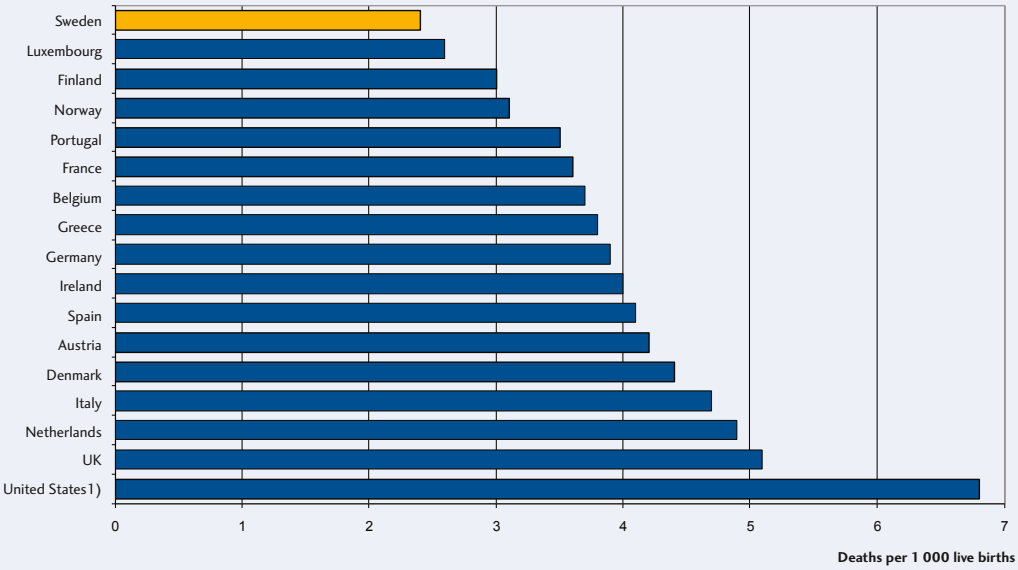


Source: OECD

**= The indicator is part of the results index*

Sweden had the lowest infant mortality rate. In 2005, 2.4 Swedish infants per 1 000 live births died during the first year of life. Average infant mortality in the EU countries was 3.8 per 1 000 live births. At 6.8, the United States had the highest infant mortality rate per 1 000 live births.

Infant mortality, 2005*

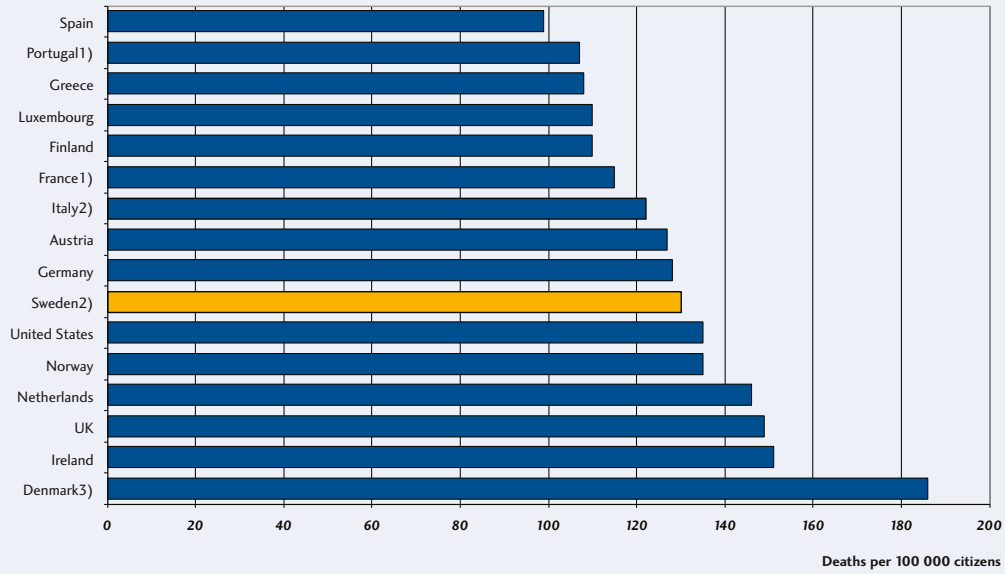


Source: OECD 2007 [1]=2004

**= The indicator is part of the results index*

Swedish men had the fewest deaths from cancer per 100 000 citizens. Spanish women had the fewest deaths, while Sweden was in tenth place.

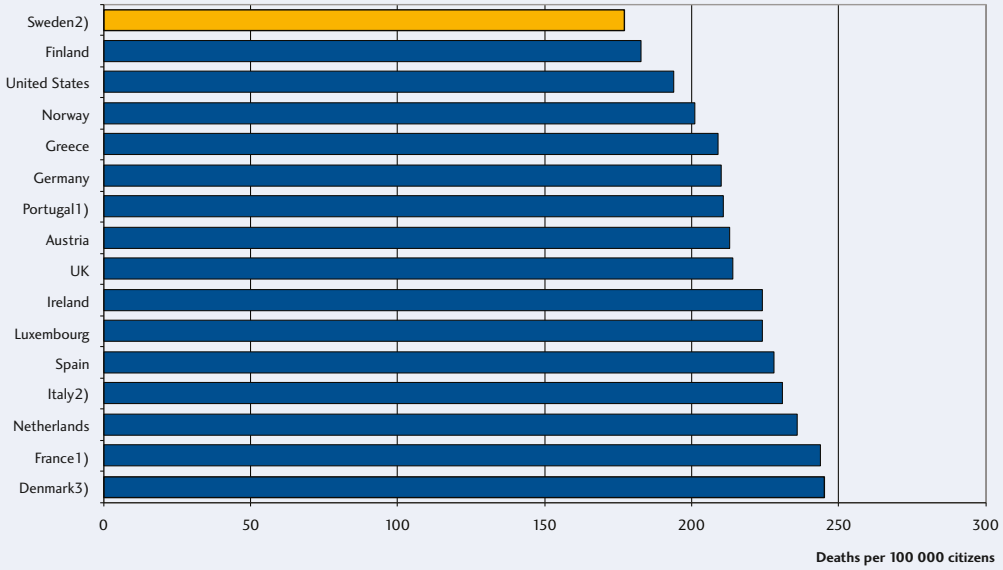
Number of deaths from cancer per 100 000 citizens in 2004, women*



Source: OECD 2007 [1]=2003 [2]=2002 [3]=2001

**= The indicator is part of the results index*

Number of deaths from cancer per 100 000 citizens in 2004, men*

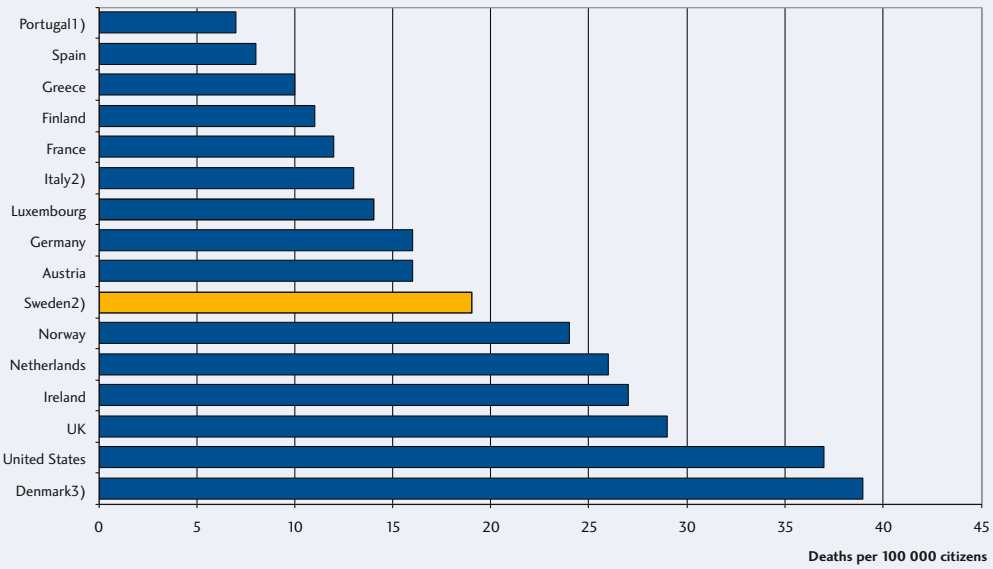


Source: OECD 2007 [1)]=2003 [2)]=2002 [3)]=2001

**= The indicator is part of the results index*

Deaths from lung cancer were higher among men than women in all of the countries. At 30 per 100 000 citizens, Sweden men had the fewest deaths, whereas the Netherlands had the most at 72 per 100 000. Portuguese women had the fewest deaths with 7 per 100 000 citizens. Swedish women were in tenth place with 19 deaths per 100 000 citizens.

Number of deaths from lung cancer per 100 000 citizens in 2004, women*

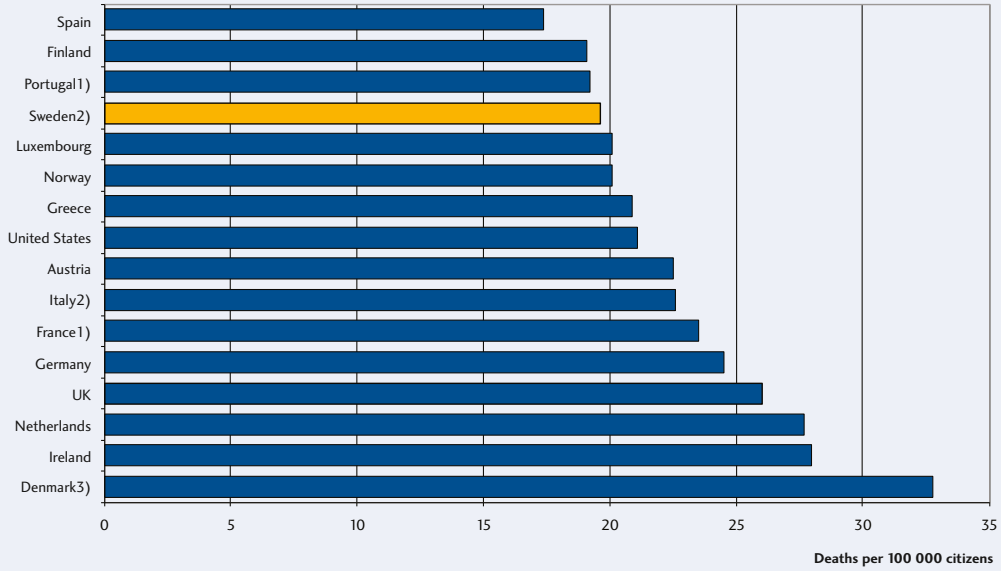


Source: OECD 2007 [1)]=2003 [2)]=2002 [3)]=2001

**= The indicator is part of the results index*

The number of deaths from breast cancer varied between 17 and 33 per 100 000 citizens. Spain was lowest with 17, and Sweden in fourth place with 20, deaths per 100 000 citizens.

Number of deaths from breast cancer per 100 000 citizens in 2004*

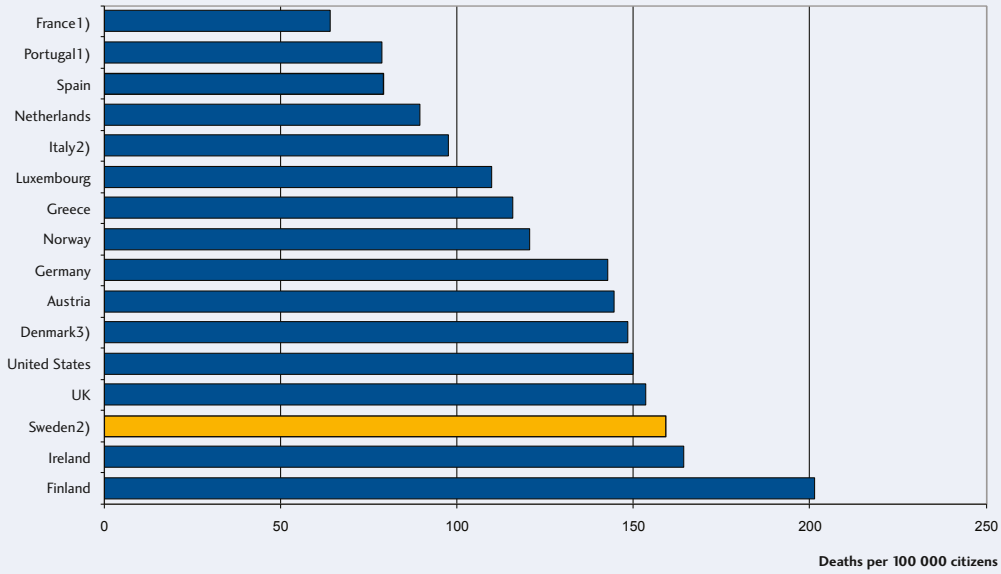


Source: OECD 2007 1)=2003 2)=2002 3)=2001

**= The indicator is part of the results index*

Ischaemic heart disease is a serious condition that carries the risk of developing heart infarct and accompanying heart failure. Deaths were considerably higher among men than women in all of the countries. Finland had the most deaths among both women and men. In 2004, 159 Swedish men and 76 Swedish women per 100 000 citizens died of ischaemic heart disease. Thus, Sweden had the most deaths from ischaemic heart disease per 100 000 citizens among the countries compared in this report, and its rates were high for both women and men. France had the fewest number of deaths among both women and men.

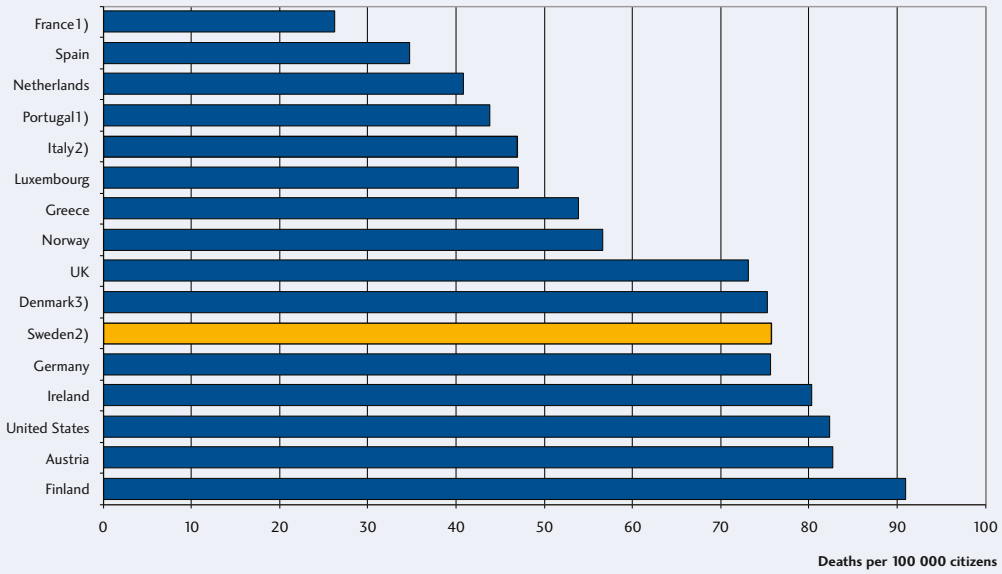
Number of deaths from ischaemic heart disease per 100 000 citizens in 2004, men*



Source: OECD 2007 1)=2003 2)=2002 3)=2001

**= The indicator is part of the results index*

Number of deaths from ischaemic heart disease per 100 000 citizens in 2004, women*

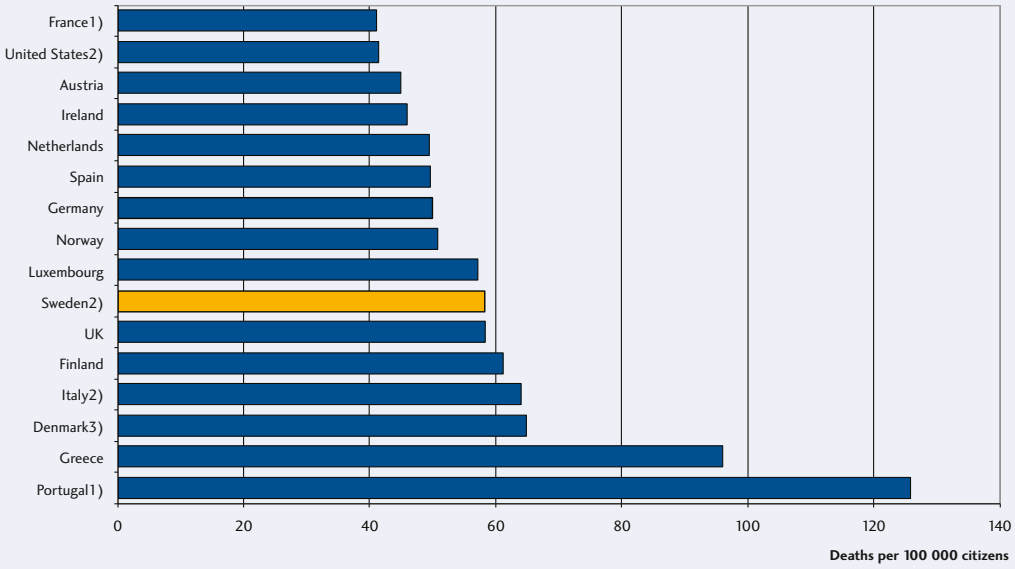


Source: OECD 2007 1)=2003 2)=2002 3)=2001

**= The indicator is part of the results index*

Stroke is one of the most widespread diseases, with 700 000 new cases in the EU countries and 30 000 in Sweden every year. Almost one out of every two people who are hospitalised for a neurological disease are stroke patients. Ranked according to the fewest number of deaths, Sweden was in tenth place for both women and men. Portugal had the highest number of deaths and France the lowest among both women and men.

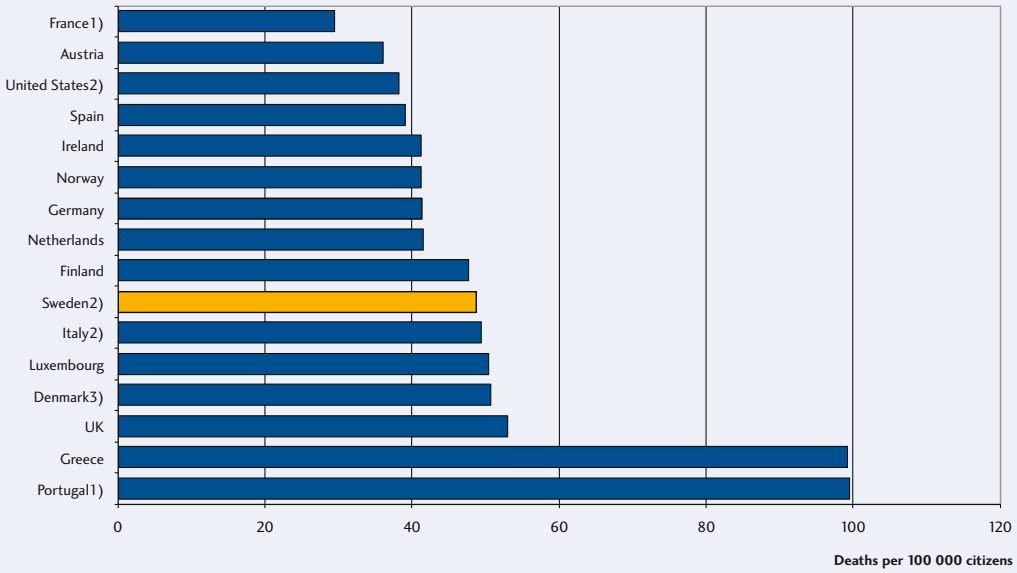
Number of deaths from stroke per 100 000 citizens in 2004, men*



Source: OECD; Helth at Glance 2007 1)=2003 2)=2002 3)=2001

**= The indicator is part of the results index*

Number of deaths from stroke per 100 000 citizens in 2004, women*



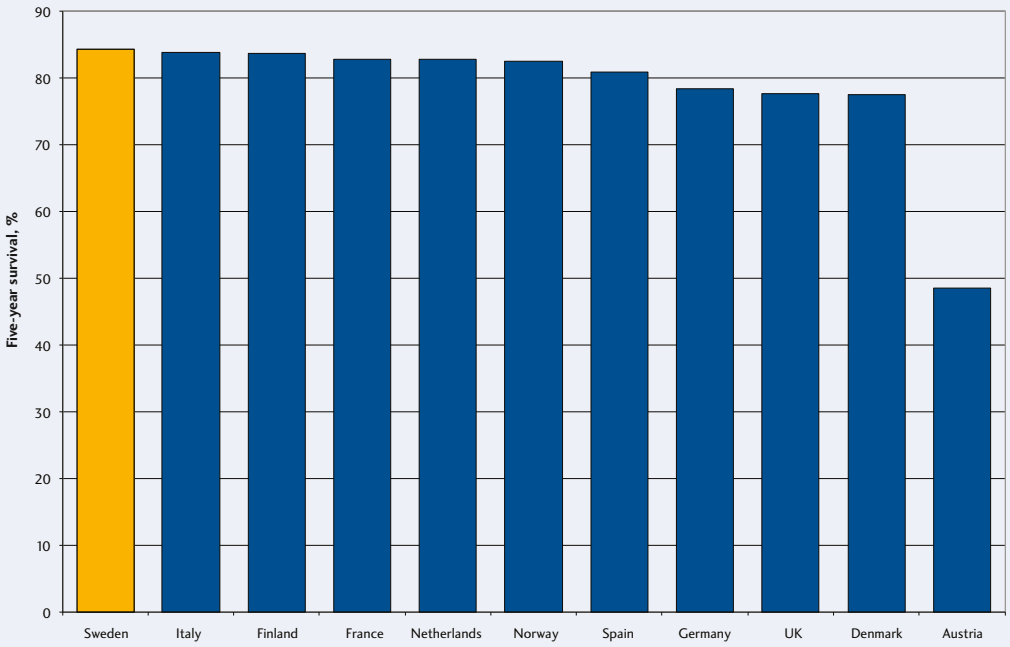
Source: OECD; Helth at Glance 2007 [1)]=2003 [2)]=2002 [3)]=2001

**= The indicator is part of the results index*

Breast and prostate cancer, the two most common forms, account for one third of all cancer cases. The Lancet (August 2007) compiled and published data on five-year survival rates for several types of cancer diagnosed in 1995-1999.

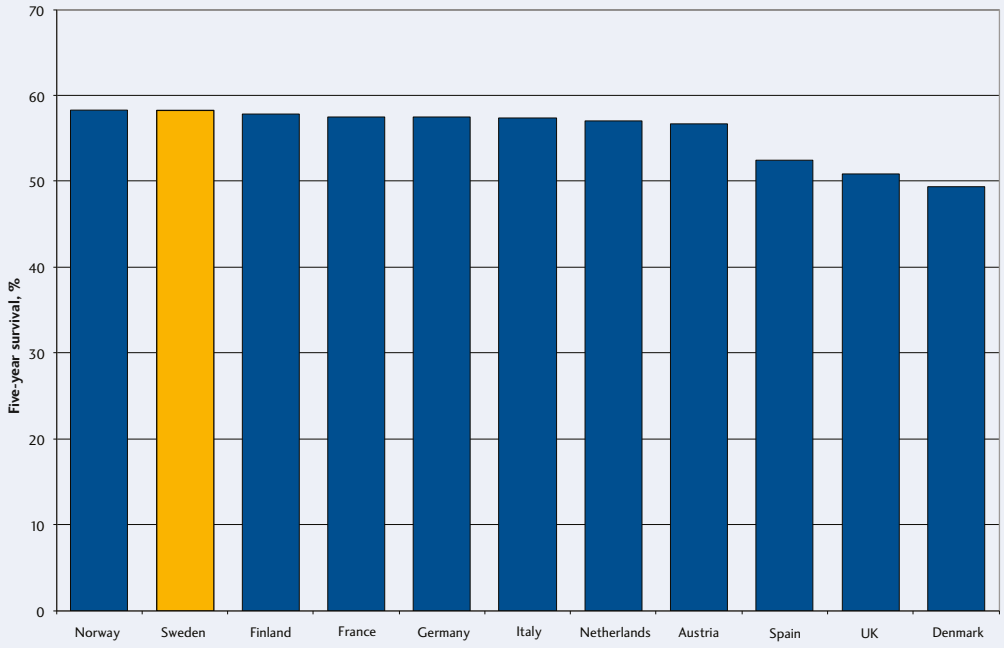
Sweden was first for breast cancer and seventh for prostate cancer.

Breast cancer, five-year survival rate, age-standardised (diagnosed in 1995–1999)



Source: The Lancet, Augusti 2007

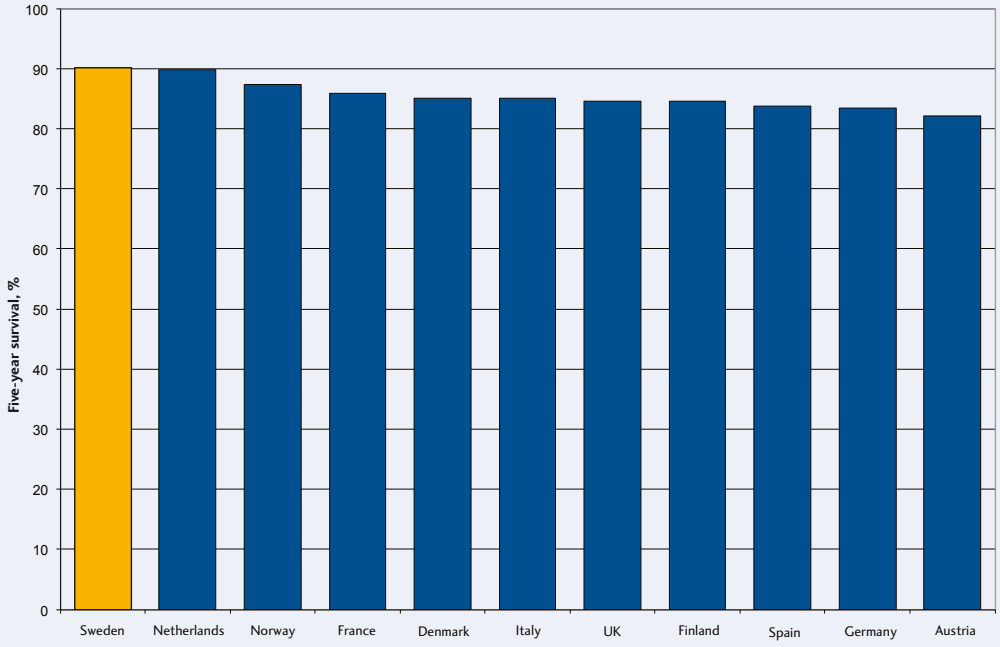
Colon cancer, five-year survival rate, age-standardised (diagnosed in 1995–1999)



Source: The Lancet, Augusti 2007

Sweden was first for skin cancer and shared first place for colon cancer.

Skin cancer, five-year survival rate, age standardised (diagnosed in 1995–1999)

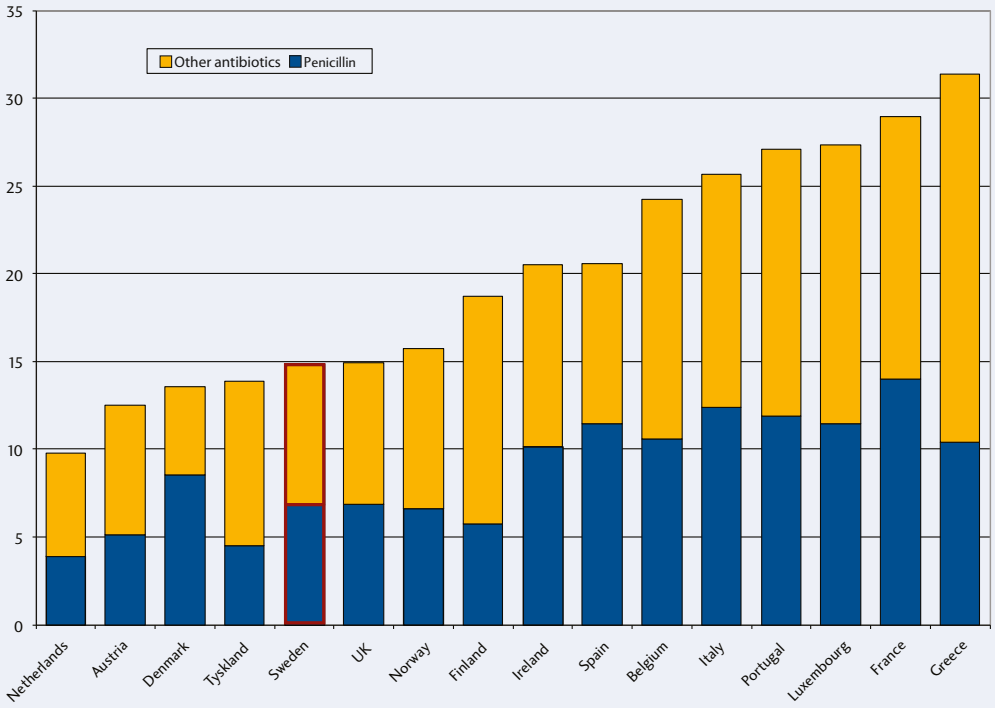


Source: The Lancet, Augusti 2007

CERTAIN PREVENTIVE INTERVENTIONS

To avoid the development of resistance, antibiotics should be handled carefully. Sweden uses antibiotics rather sparingly and has relative low resistance.

Sales of antibiotics in outpatient care, 2003*



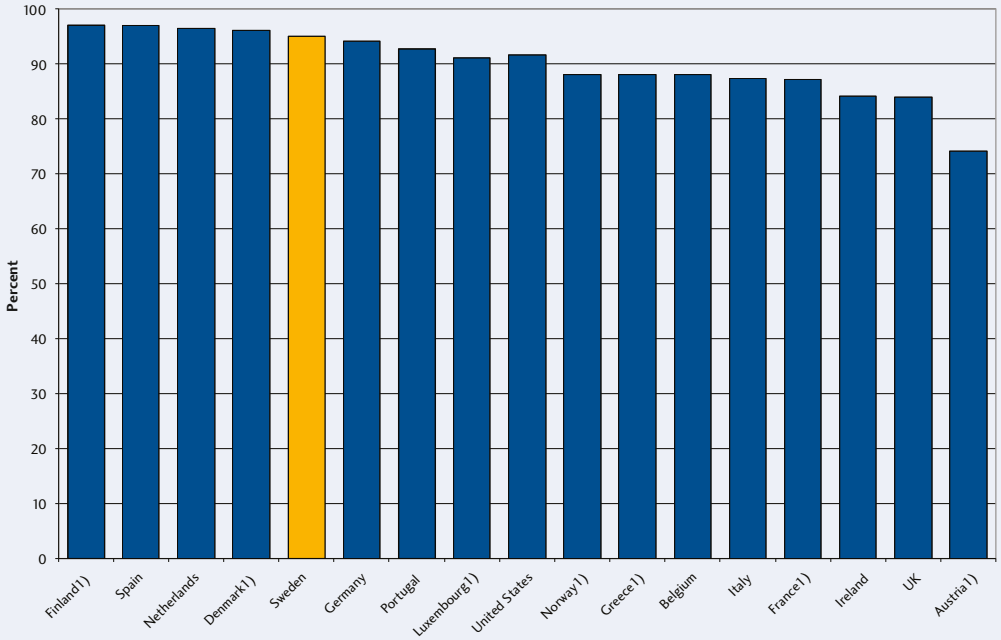
Source: European Surveillance of Antimicrobial Consumption (ESAC)

Defined Daily Doses per 1 000 citizens/day

**= The indicator is part of the results index*

All parents in Sweden are given the opportunity for their children to be vaccinated against eight serious diseases, including diphtheria, tetanus, pertussis and measles. In 2005, 95 percent of Swedish children had been vaccinated against measles, putting it in fifth place among the countries compared in this report. Sweden was at the top when it came to vaccination of children against diphtheria, tetanus and pertussis.

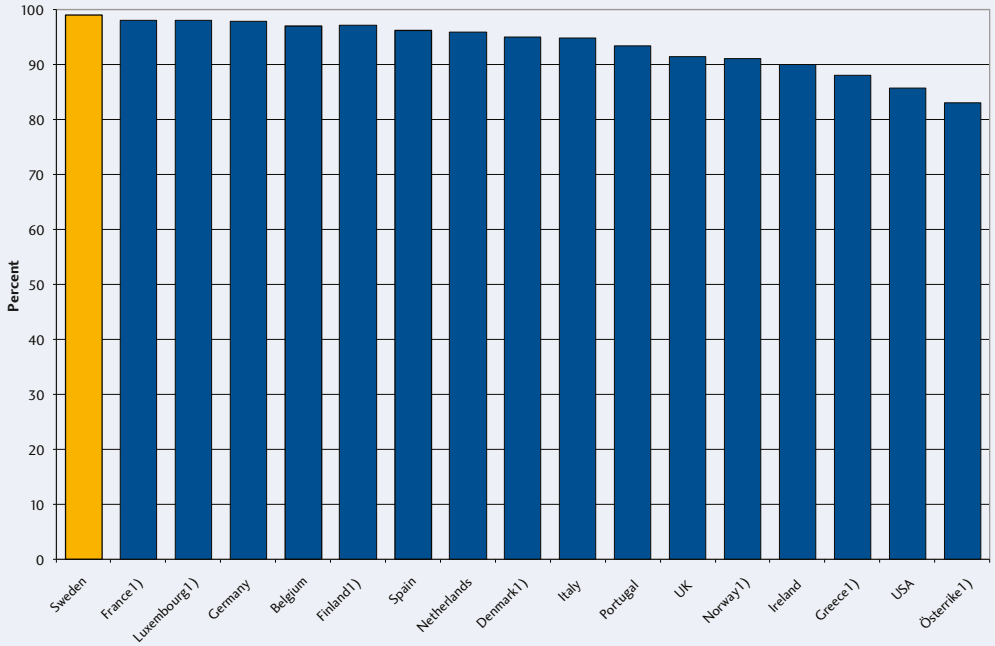
Number of children vaccinated against measles in 2005*



Source: OECD 2007 *1)=2004*

**= The indicator is part of the results index*

Number of children vaccinated against diphtheria, tetanus and pertussis in 2005*



Source: OECD 2007 *1)=2004*

**= The indicator is part of the results index*

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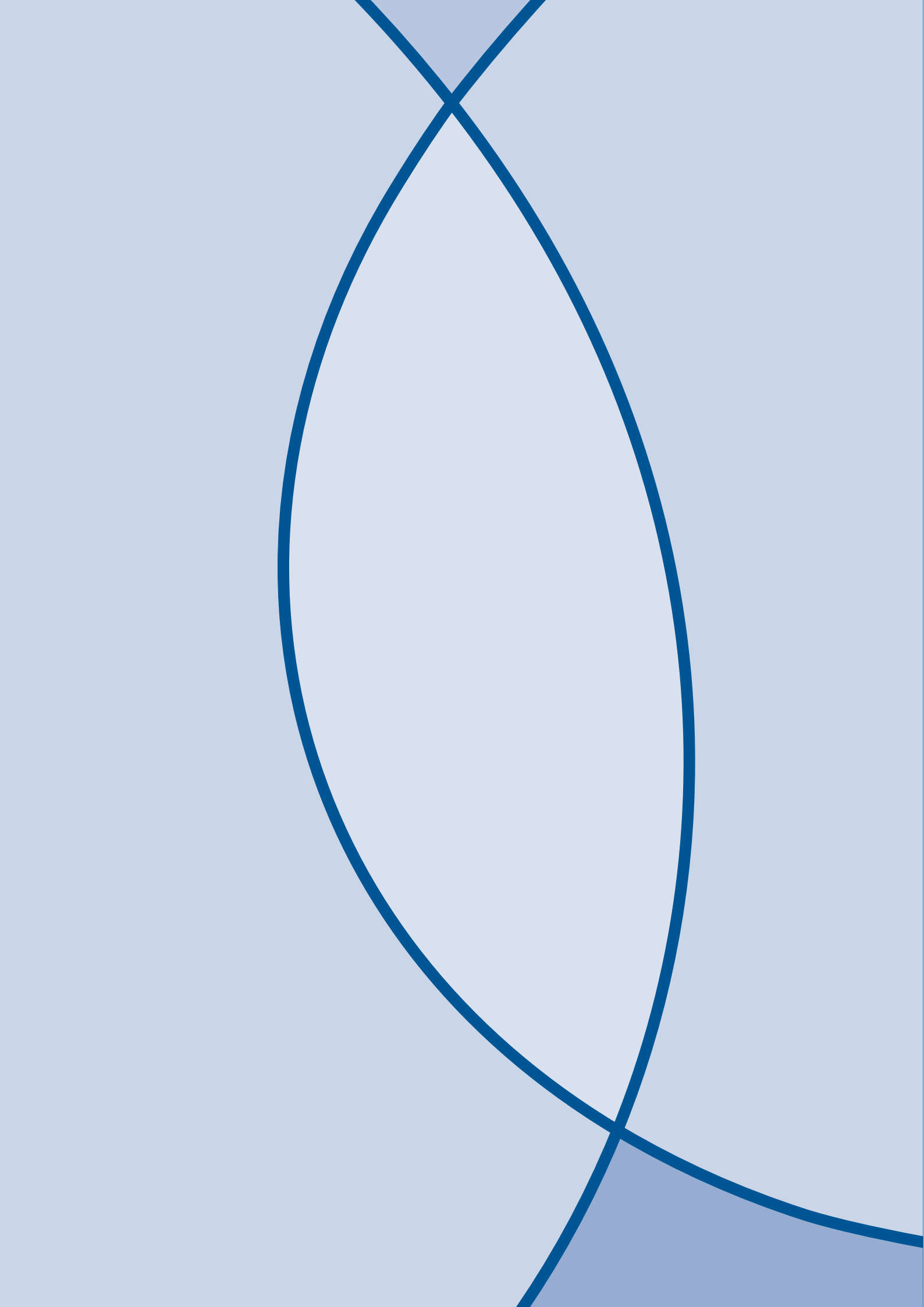

The Swedish Healthcare System:

How Does It Compare with Other EU Countries, the United States and Norway?

June 2008

The Swedish Association of Local Authorities and Regions regularly publishes data to evaluate cost-effectiveness in sectors for which local authorities and regions are responsible. The purpose of this report is to compare the performance of the Swedish healthcare system with that of other Western industrialised countries.

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of Local Authorities
and Regions

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