

Setting Priorities in Health Care

– A Cost Containment Strategy?

Abstract

The discussion regarding priorities in health care has been intense in Sweden for more than a decade. Policy makers are worried that the growing need for health care in the future is going to outpace the resources in the national economy. It has become commonplace to argue that priorities and rationing of health care is required to solve the constraints of limited funding. This has led to the formulation of the priority law which took legal force in 1997. In this thesis I will investigate the future financial needs for the Swedish health care sector and the factors that influence cost development. In order to answer the key question; if rationing of health care services can limit the cost expansion, the theoretical and empirical evidence of the priority process is studied. Not surprisingly, there are strong indicators suggesting that there will be a substantial lack of financial resources for the health-care sector for the next two decades, caused by a complex interaction between demographic changes and advances in medical technology. Theoretically, the priority process is a sound method that promotes an efficient resource allocation and brings cost savings. In practice, there are complicating factors that may compromise the cost containing effect more than expected.

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May 30, 2006
13.15-15.00 Room 328

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1. Introduction

Medical care has always been subject to priorities. The priorities have traditionally been made implicitly by doctors and health administrators working within fixed budgets. In order to promote equity and efficiency, explicit rationing is advocated as more appropriate by researchers. An increasing number of countries around the world are currently experimenting with explicit priority setting. The well-known Oregon experiment is more than a decade old, and the governments in Norway, Britain, New Zealand and in the Netherlands are currently active in projects aiming at introducing priorities in health care. The hope is that rationing health care might limit tension between the demand for health services and the cost of providing them in the future.

The purpose of this essay is to investigate the practical barriers and effects of implementing priority setting activities in health care. Specifically, this paper examines if the priority process in Sweden can help solve the growing concern regarding future financing. In order to answer this question it is necessary to find out if there is going to be a shortage of resources in the future and what factors are affecting this development.

This thesis is composed of seven sections. After this introduction; chapter two discusses the Swedish financing model and the theoretical aspects of financing health care. The third chapter analyses the historical Swedish health care expenditures with some international comparisons. Chapter four is focused on the main factors that influence future health care spending and the expected level of health care expenditures in the future. In the fifth part, the priority process is covered. In this section the priority reforms in other countries and initiatives in Sweden are described and analysed. The advantages and disadvantages of health economic evaluations are discussed and their importance for achieving an effective resource allocation. A discussion regarding ethical aspects and current legislation is included. The last parts of the essay, chapter 6 and 7, are summarizing the thesis with an analysis and conclusion.

This essay foremost relies on critical analysis of information and material that has been collected from a number of sources. Governmental reports and investigations have been of important use to learn about the background of the priority process in Sweden and in other countries. Previous academic research has offered insight into the theoretical aspects of health economics and related subjects.

Due to a limited time frame, this thesis has certain demarcations. There are several factors that influence the level of funding needed for the health care sector in the future. This essay is concentrated on discussing the role of the priority process in this matter. It is not within the scope of this paper to investigate the effects of organisational changes and structural reform on health care efficiency and productivity.

This essay aims to make a contribution to the discussion concerning the implementation of priority setting methods in health care. The analysis in this essay is therefore tailored for the broad macro view. The intention is not to solve the financing problems of the Swedish health care sector. Hopefully, some interesting ideas and thoughts are produced in this paper.

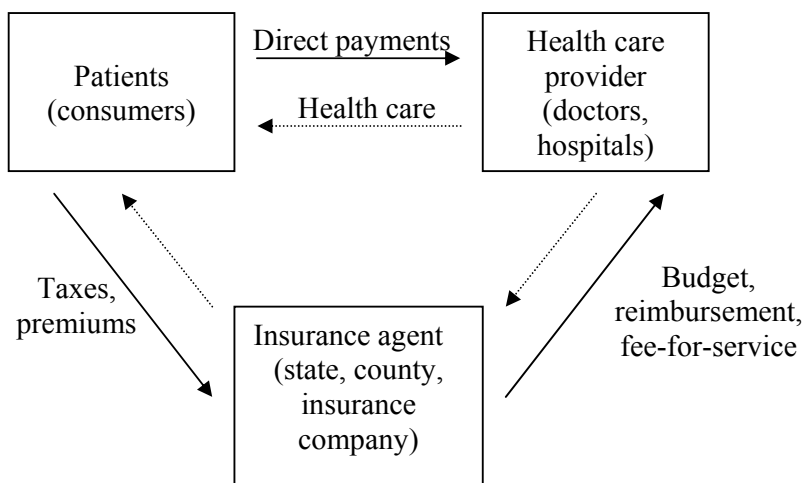
2. The financing system and health care costs

2.1 Theoretical aspects of financing health care

The organisation of a health care system is not as simple as any standard market composed of buyers and sellers. There is a substantial element of uncertainty in health care. Health care is expensive and to a large extent people are unaware of their future needs. Because people prefer certainty to risk, based on expected utility theory, most health care markets are organised as insurance markets (Arrow, 1963).

Depending on a society's desire to create equity in health care, the insurer can either be financed by general taxes or by private payments. In figure 2.1 the relations between patients, health care providers and the insurance agent is outlined. The three-part relationship is called the market triangle of health care. The insurer can be managed either privately or publicly. The presence of a third party; the insurance agent, adds to the complexity of the situation. The insurance agent pays for the health care services that patients consume and health care providers produce.

Figure 2.1 The market triangle of health care systems

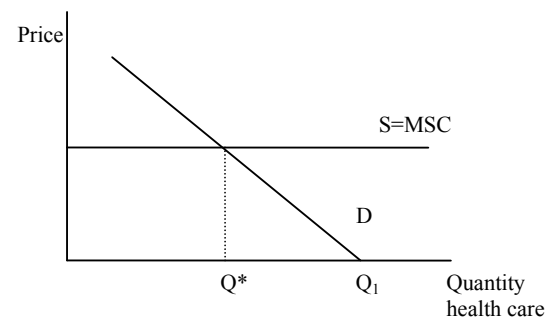


Source: Jönsson et al (2004)

There are efficiency arguments why many health care systems are regulated by the government. The first problem with free insurance markets is the occurrence of moral hazard. Moral hazard is the name given to the increased risky behaviour of a person who has insurance. The insured person behaves in a risky way because he does not suffer the full consequences, or may benefit from the situation. For example: a person may engage in activities - for example smoking - but do so because he or she feels more secure by the knowledge that future costs of treatment will be covered by the insurance. The result can be an upward pressure on health care costs and insurers find that payouts exceed their premiums. Pauly (1968) noted that moral hazard could create such significant utility loss that insurance would become undesirable.

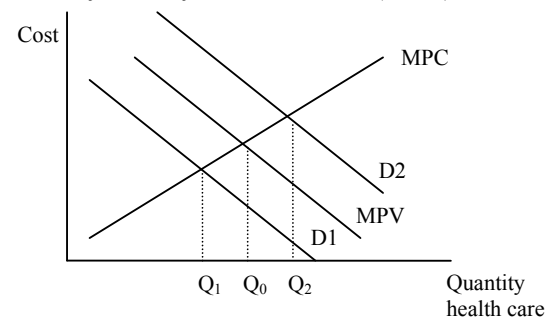
Moral hazard can arise in two ways; ex ante and ex post. In ex ante moral hazard an insured person lives a very risky life and does not take precautions. In ex post, the insured person (who is ill) consumes more health care than what is economically sustainable; i.e. the marginal cost exceeds the marginal benefit. It is the moral hazard of the latter type that is the most common problem in health care. When the doctor and the patient are separated from the insurance agent they both face zero personal costs. Health care is free for the patient and the doctor is not constrained by the patient's ability to pay. The result is an inefficient outcome with an over-consumption of health care. This is illustrated in figure 2.2 where the marginal supply curve is flat because of the insurance system. Since patients face zero costs they are stimulated to consume at Q_1 instead of at Q^* which is the efficient consumption. The problem with moral hazard has led to extensive governmental intervention in health care markets (Barr, 2004).

Figure 2.2 A simple market for health care. Source: Barr (2004)



Whilst the problem of moral hazard can produce market inefficiencies, health care is also different from many other markets because of the presence of a substantial degree of asymmetric information between the provider and the patient. The health care provider (doctor) has more knowledge than the patient and the patient relies on the physician to help make decisions. It is difficult for patients to know what type of health care they need and in what quantity. Patients are poorly informed about health care because there is a limit to what they can understand. Because of unequal information and unequal power in the relationship between the provider and the patient there is a risk of inefficient health care consumption. However, it is unclear if this leads to under- or over-consumption of health care. Over-consumption can be the result of supplier induced demand, resulting from the exploitation by doctors on consumer's ignorance and the presence of a third party payer. On the contrary, heavy consumer ignorance can lead to under-consumption because the patient does not know what to he or she needs. This is illustrated in figure 2.3. At the optimal quantity Q_0 , the marginal production cost (MPC) meets the marginal productivity value curve (MPV). Because of information asymmetry and consumer ignorance the result can be under-consumption of health care; demand curve D1 results in Q_1 . Theoretically it can also result in over-consumption; demand curve D2 results in Q_2 .

Figure 2.3 The effect of information asymmetry. Source: Barr (2004)



Over-consumption can be the result of supplier induced demand, resulting from the exploitation by doctors on consumer's ignorance and the presence of a third party payer. On the contrary, heavy consumer ignorance can lead to under-consumption because the patient does not know what to he or she needs. This is illustrated in figure 2.3. At the optimal quantity Q_0 , the marginal production cost (MPC) meets the marginal productivity value curve (MPV). Because of information asymmetry and consumer ignorance the result can be under-consumption of health care; demand curve D1 results in Q_1 . Theoretically it can also result in over-consumption; demand curve D2 results in Q_2 .

Information asymmetry is also a problem between the private insurance agent and the patient. The insured patient knows more about his health status and future health risks than the insurance company. This can lead to inefficiencies in the market because of the risk of adverse selection (Akerlof, 1970). Those who are increasingly sure that they will need medical insurance will be most interested to apply for the insurance. As a result insurance companies will deny insurance to persons with chronic diseases, congenital illnesses and

elderly because they are at risk of consuming more health care than they pay premiums. This can create gaps in insurance coverage in private health insurance markets.

2.2 The Swedish health care system

The previously mentioned problems with moral hazard, information asymmetry and adverse selection can completely destroy an insurance market. This is why many countries have significant governmental intervention in the health care sector. By introducing different methods of governmental regulation, efficacy and equity in health care can be promoted. Generally, health care markets are organised in three types of regimes: (1) market production and allocation (with or without income transfers); (2) public production and allocation; and (3) intermediate strategies (Barr, 2004). In this context, the Swedish health care system is of the second type. Sweden has a national health insurance system with public allocation of resources from general income taxes. The majority of health care services are provided by publicly owned and managed hospitals and primary health care centres.

The health care system in Sweden is highly decentralized and uniform across the country. Health care is organised and governed mainly by the 20 county councils and 290 municipalities. The health care system is a hierarchical organisation divided into several levels. The basic health care service lies at the primary health care centres. Each county has providence hospitals (2-4 less specialised hospitals) and a county hospital. On a higher hierarchical level, the country is divided into 5 regions where the counties cooperate in the highly specialized hospital care. Finally, at the national level there are centres with responsibility for the most specialized care, for example, transplantations and paediatric heart surgery.

During the last two decades the health care system has become even more decentralised in Sweden. The state has gradually turned over more responsibility on the county councils and municipalities. For example, in the 1980s the university hospitals were turned over to the county councils. Furthermore, in 1992 a major reform was carried out when the municipalities became responsible for the health services concerning residential care, excluding physician services. This reform has been called “ädelreformen”. The most recent decentralising step was in 1996 when the county councils took over the administration of financing prescription drugs. The county councils are now compensated by the state through a special pharmaceutical subsidy.

During the last few decades there has also been a tremendous structural reformation of the Swedish health care organisation. The number of complete emergency hospitals has decreased from 115 to 60 between 1960 and 2003. During the same period the number of beds has decreased by 80 per cent. However, the bed utilization rate has increased by 30 per cent during the last 10 years. These structural changes are an effect of the improvement in medical technology which has led to more polyclinic and home care. In addition, the socio-economic crisis in the early 1990's led to major cost cuts which stimulated the structural reforms (Federation of Swedish County Councils, 2004).

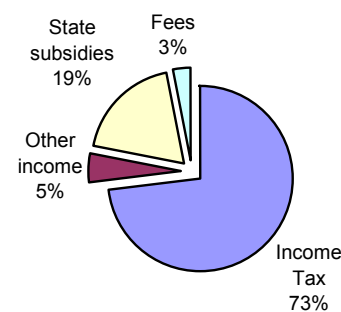
In the 1990's many county councils implemented a separation between purchaser and provider of health care. The providers were still publicly managed but the idea was to experiment with fee-for service reimbursement to stimulate productivity and efficiency. This reimbursement system led to higher health care costs because providers got incentives to produce more. Today, there are only three county councils left who have purchaser and provider separation in combination with fee-for service reimbursement. 17 county councils distribute resources to the providers by fixed budgets (Federation of Swedish County Councils, 2006).

2.3 The financing system

Health care is overwhelmingly tax financed in Sweden. Privately financed health care is marginal, only 0.25 per cent of total health expenditure (Jönsson et al, 2004). The county councils total income in 2003 amounted to around 186 billion SEK. According to Statistics Sweden, 92 per cent of the revenue is spent on health care and dentist care. The rest is expenditures on local transportation services.

Figure 2.2 shows the distribution of the county council's income sources. The county and municipal taxes accounted for 73 per cent of the county councils revenues. Patient charges and fees are a relatively small source of income, constituting 3 per cent of the total income.

Figure 2.4 Distribution of county councils income in 2003. Source: Statistics Sweden



It is interesting to note that the state has direct influence over 19 per cent of the county councils budget via several different subsidies. One kind of subsidy is the general state subsidy, constituting 4.5 per cent of total county council revenue. Other subsidies are compensation for the prescription drug benefit program and some direct specified subsidies (Statistics Sweden, 2005).

What is not discernible in the figure is the presence of a tax reallocation system between municipalities. This system is established for equity purposes based on population size, tax paying capacity, age structure, and geographical conditions. The system is decided upon by the Swedish parliament. With the tax allocation system, the state exerts additional influence over the county councils economy. This results in substantial loss of income for some county councils and for others a necessary source of additional income.

2.4 Analysis of the Swedish financing system

Some researches argue that the Swedish health care financing model is very instable and has negative consequences for the efficiency of the health care system (Jönsson et al, 2004). The majority of county councils have during 1996-2001 delivered a sequence of budget deficits.

The state subsidies fluctuate from year to year and this makes it problematic for the county councils to plan operations long term. It also renders it more difficult to save for future needs and investments. Incentives are also strong to signal financial shortage in fear of receiving less state subsidies or reallocation taxes. Jönsson et al (2004) recommends a reformation of the financing system based on these observations.

One can conceive a trend of reduced tolerance with regional differences in health care supply. There has been recent legislation concerning patient rights (waiting time guarantees and free choice of care giver) and experimentation with priorities in some counties. There seems to be less public acceptance for regional inequalities in health care supply and access. Looking internationally, other nations have recently moved towards a centralisation of health care financing. Norway reformed the financing system in the year 2000 when the state overtook the financial responsibility of public hospitals. Denmark has recently reduced the number of health care districts to only 5 hospital regions and the state is financing the system.

I agree that there would be some benefits with a state financing system. A state financing system can theoretically facilitate long term financial stability in the county councils and further decrease inequalities between regions. Another positive aspect of state financing is the possibility to balance and compare health care expenditures to other public sector expenses. One negative aspect is that the county councils loses their liberty in setting their own tax levels in order to meet special requirements, needs or demands in a specific region or county.

3. The costs of health care

3.1 International comparison

When examining variations in health care spending between countries, it is customary to relate health care expenditures as per cent of GDP and expenditure per capita. Table 3.1 shows the GDP share and per capita health expenditure expressed in US dollars for several countries in the western world. These figures have been adjusted for the purchasing powers of the local currencies (PPP). When comparing the countries one finds that they vary substantially in these figures. The United States is the biggest spender in both GDP share and in terms of per capita.

Pfaff (1990) concluded in a large study that countries characterized by a national health system generally showed lower health expenditures than those financed by private payments, although there were no striking difference in health status of the populations. Pfaff argues that centrally funded health care systems offer more resistance to health care provider's abilities to increase prices and quantities of their services than privately funded systems.

Table 3.1 Health expenditure as per cent of GDP and expenditure per capita, USD PPP

	Per cent of GDP		Per capita USD PPP	
	1993	2003	1993	2003
Australia	8,2	9,3	1 542	2 699
Canada	9,9	9,9	2 014	3 003
Denmark	8,8	9	1 763	2 763
Finland	8,3	7,4	1 430	2 118
France	9,4	10,1	1 878	2 903
Germany	9,9	11,1	1 988	2 996
Italy	8	8,4	1 529	2 258
Japan	6,5	7,9	1 365	2 139
Luxembourg	6,2	6,1	1 891	3 190
Netherlands	8,6	9,8	1 701	2 976
Norway	8	10,3	1 695	3 807
Poland	5,9	6	378	677
Spain	7,5	7,7	1 089	1 835
Sweden	8,6	9,2	1 644	2 594
Switzerland	9,4	11,5	2 401	3 781
United Kingdom	6,9	7,7	1 232	2 231
United States	13,2	15	3 357	5 635

Source: OECD Health Data, 2005.

Newhouse (1977) compared in a famous study the correlation between health expenditures and national income, measured as GDP per capita, by making a regression analysis of the two variables. He found a very strong connection and no other variable could explain the correlation better. This connection is also valid for Sweden; the health expenditure per capita is highly correlated to GDP per capita in relation to other countries (Arvidsson et al, 1997). Several studies have suggested specific income elasticity for health care spending. Rich countries spend more on health care as a proportion of their income compared to poorer countries. Gertham et al (1988) found in a study of OECD countries that every 1 per cent increase in GDP is associated with a 1.5 per cent increase in health care expenditures.

The historical trends of health care spending can generally be divided into three periods for the western countries. Most western countries experienced an increase in the health care share of GDP during the period 1960-1975 (Pfaff 1990). Between the years 1975-1990 the growth rate has levelled-out. (In the United States however, there was a considerable increase in health care spending during the 1980's. This has been linked to the uncontrolled cost expansion in the private health insurance market during that period.) Finally, during the last 10 years the health care budget shares of GDP have begun to rise slowly again for western industrialized countries (Jönsson, et al 2004).

3.2 Cost development in Sweden

In Sweden, the total health care costs for the period 1993-2004 rose from 118 to 214 billion SEK in running prices. This can be transformed to an increase of approximately 50 per cent in fixed prices. Note that this figure includes both private and public expenditures. The total public consumption of health care (salaries and materials) was 172 billion in 2004, or approximately 81 per cent of the total health care expenditures.

In appendix 1, a detailed survey of outlays on medical care and health is enclosed. Total costs for health care in Sweden in 2004 amounted to approximately 214 billion SEK, corresponding to a GDP share of 8.3 per cent (see Appendix 1). What is not included in this figure is the cost for eldercare arranged by the municipalities. When international comparisons are made, a standard assessment of 0.7 per cent is common practise to add to the Swedish GDP share for these activities (Jönsson et al, 2004).

One can also see in appendix 1 that the strongest increase in health care costs began from 1997. After deflating the prices, the average cost increase is at a level of 3.9 per cent per year between 1993 and 2004. However, this figure is misleading because I have used the Swedish consumer price index to deflate the prices. The Swedish health care sector buys a unique 'basket of goods' - doctors, nurses, hospital beds, syringes, etc. It is the change in price of these inputs that are of relevance. Taking into account health-service specific inflation reduces the average annual increase to about 2.5 per cent during the last few years. During the period between 1980 and 2003 the average annual increase was only 1.4 per cent in health care fixed prices (Statistics Sweden, 2005). One can conclude that the change in real resources has not been so dramatic during the last two decades.

The growth in national expenditure on drugs has also increased tremendously since the 1980's. The Swedish drug market consists of three parts: drugs used within the hospitals, prescribed drugs and off-the-counter drugs (OTC). In table 3.2, the cost development in these areas from 1980-2004 is outlined. One can see that the total pharmaceutical sales have increased by 290 per cent during this period. There has been a gradual shift with fewer drugs consumed within hospitals, from 17 per cent in 1980 to 12 per cent in 2004. This reflects the structural reorganisation towards more polyclinic interventions. From table 3.2 one can also discern that the sales per cent of OTC drugs has remained unchanged from 1980.

Table 3.2 Drug sales in Sweden

	Total	Hospital	Prescription	OTC
Year	MSEK	per cent	per cent	per cent
1980	3619	17	74	9
1985	5860	18	73	9
1990	10050	16	76	8
1995	17388	12	79	9
2000	25069	13	79	8
2004	29174	12	80	8

Source: The Swedish Association for Pharmaceutical Companies

According to Statistics Sweden (2005) the pharmaceutical sales have risen from 8.6 per cent of the total health care expenditures to 13.3 per cent during the period 1990-2004. From the government's perspective, the cost of the national drug subsidy has increased dramatically from approximately 800 MSEK in 1990 to 11,000 MSEK in 2003 (The Swedish Association for Pharmaceutical Companies, 2005).

In average the growth in pharmaceuticals expenditure was around 10 per cent per year during the 1990's. During 2003-2005, the cost development has slowed to about 2-3 per cent increase per year. This can be explained by the generic exchange reform which was launched in 2003, which in practice means that Apoteket AB automatically switches a prescribed drug to the cheapest generic drug on the market. During this period, patents expired on a few block-buster drugs (Omeprazol and Simvastatin), which had a cost containing effect. However, the growth in drug sales has picked up again and during the first quarter 2006 costs rose by 6.7 per cent (IMS Sweden).

3.3 Analysis of cost development

When examining changes in health expenditures as a share of GDP one must take into account that it depends on two factors: the size of national income (GDP) and the total health expenditures (Folland et al, 2001). Total health expenditures (E) is equal to the price of health services (P) multiplied with the quantity consumed (Q), or $E=PQ$. If we define the share (s) of national income (Y) spent on health care, the following equation holds: $s=PQ/Y$.

Simple mathematics shows that the following identity holds:

$$(\%Change)s = (\%Change)P + (\%Change)Q - (\%Change)Y.$$

According to the formula above, the health care expenditure share of GDP can increase in three ways: (1) the price of health care production factors increase; (2) the quantity produced increases; or (3) the national income (GDP) falls. If the quantity consumed increases at the same rate as the national income and the prices are unchanged, then the health care share of GDP does not change.

The formula above holds that the health care share of GDP can rise because of economic stagnation. One must therefore be cautious when using the GDP share as a measure of the amount of health care that is produced. A higher GDP share can be interpreted as more money for health care, when in fact resources have decreased but in a lesser proportion than GDP has fallen.

In addition, the price component can have major effect on the health care expenditures. The relative price of health care services has historically been a relatively significant component behind the growth of health care costs. The factor that exerts most influence on the price component is changes in real wages in the health care the work force. Higher real wages is oftentimes caused by productivity gains in the economy. As a result, the relative price of health care can exert upward pressure on health care share of GDP without affecting the quantity produced.

In table 3.3 the growth of health expenditures from 1950-2003 is outlined together with the growth in GDP and the relative price of health care. Note that the growth in health care is denoted in fixed prices; adjusted for price changes in health care specific goods. One can see that there was a rapid growth in health care spending between 1950 and 1980.

Between 1980 and 1995 the growth in health care spending was slower than before. During 1995-2003 the growth rate picked up again.

One can also discern from table 3.3 that a significant factor influencing the GDP share during the period 1950-1980 was the relative price of health care compared to the general price development in the Swedish economy.

Between 1980 and 1995 the relative price of health care was lower than normal due to low real wage increases. As a result of the sluggish price development of health care in comparison to the rest of the economy during this period, the health care share of GDP decreased. Furthermore, the socio-economic crisis of the early 1990's lead to structural changes and cost savings which contributed to the low real growth rate in the health care sector. During the time period 1995-2003 the relative price of health care has been on a historically normal level. The consequence is a climbing health care GDP share from 1995.

Table 3.3 Growth of health care expenditures

<i>Period</i>	<i>Real Growth of Health care spending fixed prices per cent</i>	<i>GDP Growth (per cent)</i>	<i>Relative Price Health care</i>	<i>Health care change in GDP share (per cent)</i>
1950-1960	6.1	3.4	1.5	1.5
1960-1970	5.4	4.6	3.6	2.4
1970-1980	2.4	1.9	2.3	2.2
1980-1985	1.6	1.9	-0.7	-0.4
1985-1990	1.6	2.5	0.2	-0.3
1990-1995	0.5	0.8	-0.2	-0.2
1995-2000	1.9	3.2	2.3	0.3
2000-2003	2.5	1.5	2.7	0.8

Source: Swedish Federation of County Councils, 2005

4. Future cost projection

There is growing concern about how the national health care system is going to meet future needs when public finances limits the necessary resources to be invested. This problem is not unique for Sweden. Around the globe, policymakers are troubled about how their health care system will be able to contain the cost development in the future.

It is difficult to predict the level of health care spending in the future. The health care market is complex and there are several factors that influence the future cost development. How the health care market is organised for example, can affect the degree of productivity and efficiency, leading to cost savings. And also, as illustrated in the previous section, changes in production costs can influence the total expenditures. The impact of these factors on future health care spending will not be investigated further in this paper.

In this section we are instead going to focus on the factors that influence the quantity of health care needed. The four major factors that affect health care needs are: the demographic trends, the future health status, the medical technological improvements and people's expectations and demands (Saarni, 2006).

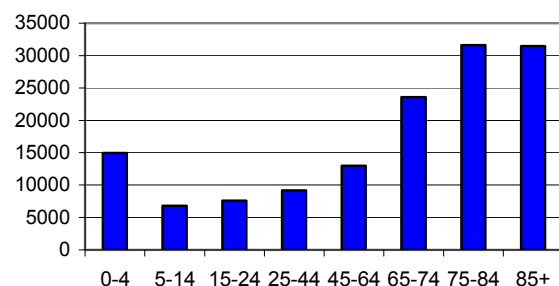
4.1 The effect of demographic factors on health care costs and public finances

Consumption of health care increases with age. Health authorities in Skåne has calculated the average health care costs in different age groups, see figure 4.1. There are large variations in different age groups. The largest difference is approximately 460 per cent between age group 5-14 and 85+. This figure also includes the increased costs of pharmaceutical use in the older age groups (The National Board of Health and Welfare, 2002)

Whilst the cost of health care is higher in older age groups, this fact should be compounded with the forecasts of an accelerating demographic shift occurring in the future. Increased longevity and declining fertility rates is shifting the population's distribution towards older age groups. The expected average life time increased from 72 years in 1950 to 80 years in 2003 (Statistics Sweden, 2005).

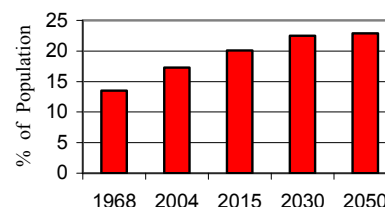
Figure 4.2 shows the share of population

Figure 4.1 Average health care costs per age group and year in Region Skåne



Source: The National Board of Health and Welfare, 2002

Figure 4.2 Population over 65 years old (%)



Source: Statistics Sweden, 2006

over 65 years of age. One can see that there will be a dramatic increase in the share of people over 65 years during the period 2004-2030. Today this group constitutes 17 per cent of the population. In 2030 this age group will represent approximately 23 per cent of the population according to Statistics Sweden (2006).

The increased population longevity will have effects on health care spending and residential care services. Based on statistics from Region Skåne, Apoteket AB and Statistics Sweden, the Federation of Swedish County Councils has calculated a forecast of health expenditures caused by the demographic trends (Federation of Swedish County Councils, 2005). In the prognosis an assumption is made that the cost per age group is unchanged in the future from what it has been in the past. This means that all other factors that can affect the cost development are excluded in the prognosis. The objective is to find out how much the demographic shift alone will affect health care costs. According to this forecast the health care expenditure would need to increase with in average 0.8 per cent per year from 2005 until 2030. The result is an accumulated increase of 22 per cent during this period only because of the demographic changes. A growth rate of 0.8 per cent can be compared to the average growth rate of health care expenditures of approximately 0.6 per cent during 1980-2003 due to demographic factors. There is a risk that this calculation might underestimate the future costs of population ageing. According to Gerdtham and Jönsson (1990) the health care costs for elderly has historically increased more than in other age groups.

Another effect of the population shift is a decreasing proportion of people who are in working age (between 20-64 years old). 80 per cent of the population growth between 2003 and 2030 will represent age groups that are not in working age. The ratio of people not in working age divided by people in working age will rise from today's 0.70 to 0.84 in 2030 (Lundgren, 2004). According to the forecast by The Federation of Swedish County Councils (2005) we can expect a very slow increase in working people in the future. The number of workers will increase by only 0.1 per cent per year until 2030. This can be compared with the growth rate of 0.3 per cent working people per year between 1970 and 2003.

The demographic shift will lead to heavy pressure on the public finances in the future because the tax base will be smaller in proportion to the number of people that should be provided for. Lundgren (2004) has estimated that this will result in a national economic growth rate that is 0.3 per cent lower in the future. Lundgren further argues that the increased costs for pensions, health care and residential care will affect the national budget balance by 6-8 per cent and create an accumulated production loss of 10 per cent during the period 2004-2030. To summarize; the demographic shift leads to a lower growth of tax income for the government and the county councils. The result is also higher costs for health care, pensions and eldercare in the future.

4.2 Changes in health status in the future

Changes in the morbidity and sickness can affect future costs for health care. There are no dramatic changes expected in the population's health status in the future. Although, there are some reports that show warning signs but other studies that describe a more positive picture.

The increased longevity carries a risk that the future population will have an inferior health status. According to a study conducted by the National Board of Health and Welfare, the self-estimated health status of elderly has declined during time (National Board of Health and Welfare, 2003). Another study shows that the health status of people between ages 77-98 has significantly deteriorated during time (Thorslund et al, 2004).

In a study by Burström et al (2003), older age groups experienced a considerable gain in both life expectancy and health status. The study used quality-adjusted life years, estimated by using data collected from the Swedish Survey of Living Conditions from 1980 to 1997. The study revealed a very sad picture of the health status of younger females. A trend of increasing health problems in younger ages over time was discovered in the study. Especially anxiety and depression conditions were becoming more frequent for younger women. This finding is consistent with previous studies from Statistics Sweden and the National Board of Health and Welfare (Burström et al, 2003).

Another warning sign is the ongoing world epidemic of overweight and obesity. This is also becoming a problem in Sweden. The institute for health economics in Lund has recently calculated the direct and indirect costs for overweight and obesity in the future. The direct costs for these diseases today amount to approximately 3.6 billion SEK and the indirect costs 12.4 billion SEK. If the number of overweight increases in the same rate as in the past, the health care costs for these conditions would increase by 55-120 per cent (Persson et al, 2005).

Other studies are more optimistic about the Swedish population's health status in the future. OECD follows a number of health indicators (expected life time, infant mortality, suicide frequency, cancer associated mortality etc.) in the European Countries. Sweden has shown a sound development compared to other countries over time (OECD Health at a glance, 2003).

4.3 The impact of new technology on health care costs

R&D in the field of biopharmaceuticals and biotechnology is intense over the world. Large sums of money are invested in developing new therapies and diagnostics. For example, the cost of developing a genuinely new drug is calculated to be about 800 million dollars and takes an average of 10 years (Bergström, 2003). Investments in research and development are made because companies expect financial return. Huge sums of money in R&D would not be invested if it there was no market interested in new products. Thus, there are strong economic forces behind the application of new technology in health care. From a medical perspective three research fields are especially promising for the future: (1) molecular biology and genetics; (2) pharmaceuticals and technical innovations; and (3) information technology. (Västra Götalandsregionen, 2002).

We know surprisingly little about how technology affects health care costs. New technology can change health care practice in a number of ways and it is not inherently cost increasing. The impact on costs is complex. According to Goldsmith (1994) there are several possible outcomes when implementing new technologies: (1) it can reduce or increase the unit cost per treatment; (2) expand or reduce the treatment population; (3) reduce or increase the risk of

complications; (4) require repetitive use or eliminate the need for further treatment; or (5) improve or complicate the patient's quality of life.

The Center for Health Economics at Stockholm School of Economics calculated the cost impact of new drugs introduced on the Swedish market (Ekelund et al, 1999). In the study 335 new chemical entities introduced during 1987-1997 were analysed and classified in terms of degree of innovation. The cost development for the innovative drugs introduced after 1987 were compared to the existing pharmaceuticals. They concluded that the total drug costs doubled during the period, with an absolute sales increase of 9.7 billion SEK. The cost of the newly introduced innovative drugs constituted 8.1 billion SEK. This study indicates that the new innovative pharmaceuticals stand for the bulk of the cost expansion in the past.

The common approach of calculating the historical cost of new technology is the residual method. This means that all other factors (demographic, production cost, inflation and quantity) are factored out and the residual is assigned to the effects of technology. The method is questionable because there are many factors that are difficult to exclude in the calculation. By using this method Newhouse (1992) has claimed that more than 50 per cent of the total rise in real medical care costs is attributable to technological changes in the US.

The Federation of Swedish County Councils has also made a calculation of residual costs in Sweden historically. They found that the increase in health care costs between 1980-2002 that can be attributable to new technology and other factors was 0.8 per cent per year in fixed prices (Swedish Federation County Councils, 2005).

However, theoretically there are some complicating aspects with the residual method. Some factors are interrelated, for example how advances in medicine affect the demographic situation. In addition, unknown factors that affect productivity are included in the residual. It is also difficult to pinpoint what the residual actually accounts for. Different degrees of intensity use of a specific technology between hospitals and countries suggest that there are many unclear forces and incentives in the medical care system other than the available medical technology. Local traditions, organisation structures and reimbursement systems probably have effect on the residual.

Geijlins and Rosenberg argue for a more methodological approach to examine the relationship between technological change and health care expenditures that would involve two steps "First, instead of focusing on all of medicine, one should disaggregate and focus on clinical conditions. Second, within these conditions, one should examine how variations of intensity use, introduction of new technologies and expansion of indications of use, contribute to health care expenditures."

I believe that Geijlins and Rosenberg have a point in this matter. In order to get insight into the future technological costs one must investigate each medical area on diagnosis level and try to determine what technology is going to be introduced in the near future. This has recently been done in Sweden. In 2002, doctors from all medical specialties in the Region of Västra Götaland analysed the future development in their respective area concerning new therapies and diagnostics. They concluded that new methods will be incorporated in every

medical field in the future. Since medical development makes intermittent leaps it is hard to foretell, but the application of new technology will accelerate, they argue. This will lead to higher costs for new technologies. The doctors also emphasise the importance of critical review and assessment of new technology because of the need for cost containment in the future (Västra Götalandsregionen, 2002).

In many cases the implementation of new technology in health care leads to increased productivity; a possibility to produce a given volume of output with a smaller volume of inputs. However, in medicine, new technologies often results in wider treatment indications. Take for example the introduction of laparoscopic surgery in the beginning of the 1990's. The new technique lowered the average procedure costs from 28,279 SEK to 25,878 SEK because of shorter hospital stays (Berggren et al 1996). As a result of the implementation of minimally invasive laparoscopic surgery the number of gallbladder operations increased dramatically by 2000 operations between 1991 and 1994 (Arvidsson et al, 1997). Oftentimes in clinical medicine, a new more efficient technology creates a new need. As a result, this may lead to higher health care costs. This relationship has been called the medical paradox.

4.4 The impact of people's demands and expectations

It is logical that the demands and expectations of the public can influence the level of expenditures on health care. In fact, researchers believe that this is one of the reasons why women are not treated equally compared to men for heart diseases. According to a report by the National Board of Health and Welfare (2004) women statistically receive less medication, cheaper pharmaceuticals and have a higher mortality rate. One contributing factor why women get less quality health care is because they demand less and have lower socio-economic power than men (Månsdotter et al, 2004). The demands of specific groups in society will certainly also play a role in the distribution and availability of health care resources in the future as it has done in the past.

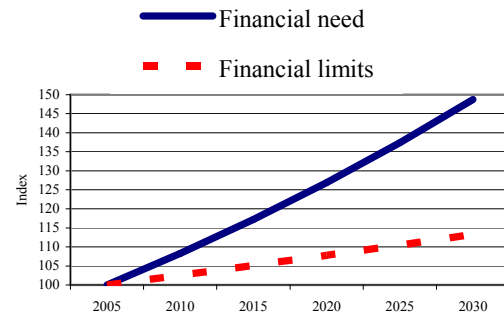
In 2001 the European Union released a policy document concerning the future developments in the health care sector in the member countries. The Union concludes that the demand for health care is heavily dependent on the standard of living and the level of education (European Union, 2001). The report also reminds us that it has been observed in the past that the demand for health care tends to increase more than proportionally to per capita income. For the future the EU tells us to expect the following: (1) better educated patients; (2) patients with higher expectations and demands for health care; and (3) patients who demand to be considered as fully-fledged partners in the health care system, demanding total transparency.

It is not possible to make an exact forecast of how the demands in the general population will affect health care spending in the future. Demand might play a greater role than it has done in the past.

4.6 Analysis of future health care costs

According to the Federation of Swedish County Councils (FSCC) the combined effect of the demographic shift and new technologies will be an increase in health expenditures by 1.6 per cent per year between 2005 and 2030. (Note that this estimate is in health care fixed prices.) This implies a demographic effect of 0.8 per cent and a residual of 0.8 per cent. A growth rate of 1.6 per cent per year will result in an accumulated cost expansion by approximately 50 per cent in 25 years time.

Figure 4.3 The divergence between needed and available financial resources for health care.



Source: Swedish Federation of County Councils

A financing problem arises because of a low estimated growth rate of the state and county councils tax revenues. According to the Federation of Swedish County Councils (2005) the growth in public consumption is limited to 0.5 per cent per year in fixed prices. This will result in an accumulated real growth in public consumption by 13.5 per cent between 2005 and 2030. Figure 4.3 shows the divergence between resources needed and the financial limits. This calculation is based on a scenario with 1.8 per cent growth of GDP per year. The GDP growth rate is adjusted to the lower range (compared to the past) because of the effects of the demographic shift in the future. The two main factors that can counteract this financial shortage in the future are: (1) a higher GDP growth rate; and (2) raised taxes.

According to Lundgren (2004), if taxes are continually raised in the future to finance the costs for pensions, eldercare and health care, the tax level would be 5 per cent higher in 2030. In this scenario the public health care expenditure as a share of GDP would increase from 7.6 per cent in 2003 to 11 per cent in 2030 (Federation of Swedish County Councils, 2005).

I argue that Figure 6 can be misleading. Note that this is a scenario based on calculations by Statistics Sweden and the Federation of Swedish County Councils. In the scenario productivity gains, increased efficiency and overcapacity in some sectors are not taken into consideration. The figure also implies that there is a balance at the start in 2005 between financial needs and resources available. There might both be overinvestment as well as underinvestment in health care today. For example, if there is a possibility to disinvest 5 per cent of the health care expenditures from inefficient medical interventions, the curves would look totally different. In that case the figure would signal an overcapacity today.

The growing concern about financing health care is the same in many other western countries. In Great Britain for example, the Prime Minister gave Derek Wanless the task to provide an update of the challenges concerning the medical trends, the demographic changes and technological advances for the coming two decades. Wanless submitted his final report in April 2002, "Securing our future health". In the report Wanless has made three different scenarios for the future. He concludes that the advances in medical technology will continue to raise costs for health care in the future. In the middle scenario, Wanless estimated the

future costs to increase by 3 per cent during the first 10 year period and then 2 per cent for the next 10 years, in health care fixed prices (Wanless, 2002).

In comparison with Wanless forecast of 3 per cent cost increase per year, the Federation of Swedish County Councils' and Statistics Sweden's estimate of 1.6% growth of health care costs per year seems optimistic. However, Wanless points out that Britain has been lagging behind other countries regarding quality and implementation of new technology in health care for a long time. Wanless argues that, there is a larger unmet need in Britain compared to other countries.

To summarise: there are several factors that signal an increase of health care expenditures in the future. The expected discrepancy between available and needed financial resources for health care is troublesome for Sweden. How large this future gap is allowed to become depends on a number of factors. Raised tax levels, increased productivity and efficiency in the health care sector, higher GDP growth rate and higher occupation rates can reduce this difference. The next section is going to discuss what priorities and rationing can do to limit the feared financial shortage.

5. Setting priorities in Swedish health care

5.1 Background on priority setting

Priorities have always been made in health care. Resources are scarce and will always be. Every time a decision regarding distribution of resources is made there is an alternative cost. In this choice lies a priority. Priorities are made on several levels; the political, the administrative and the clinical. On the political/administrative level, priorities are concerning the distribution of resources among hospitals and between health care providers. In this regard priorities are referred to as *horizontal*. On the clinical level priorities concern different medical conditions and patients; *vertical* priorities.

By the term priority is meant a process in health care in which policy makers makes an explicit ranking of different interventions or between different patients. Rationing is an economic term that refers to the distribution of goods during conditions of limited supply in relation to demand or need.

The allocation of resources in many health care systems has traditionally been conducted on the basis of historical or political patterns: “what you got last year, plus a little more or less, depending on the budgetary situation.” This kind of resource allocation carries a risk for a suboptimal use of limited funding. The following sections are going to cover the fundamentals of the priority setting process with a focus on Sweden.

5.2 Principles of justice in health care rationing

In the process of setting priorities and rationing of health care services, many ethical statements and values are expressed. This section contains a brief description of the major justice rationales for health care rationing; the need principles, the utility maximizing principle and the egalitarian principle.

Need principles

The term ‘need’ is often used in debates about health care rationing. In the Swedish health care law it is stated that health care shall be distributed according to need. Policymakers judge that it is important that health care is distributed according to need instead of the population’s demands and wants. If public demands and wants were allowed to govern, there is a risk that some weak groups in society are neglected. Many physicians also refer to the term ‘clinical need’ when they make decisions regarding treatment.

Depending on the definition of need, different allocations of resources are obtained when rationing health care. One strategy is to define need as the ‘degree of illness or disability’. The one who is most ill in relation to others simply has the greatest need for health care. The degree of illness is related to the initial health of the individual. One problem with this definition is that the person who is most ill might be the one who is the most costly to benefit. In many cases it would be a waste of financial resources if those with the gravest conditions got unlimited resources irrespective of the treatment’s cost-effectiveness (Culyer et al, 1993). However, sometimes in immediate life-threatening situation a society has a duty to do

everything possible to save a life and cost-efficiency cannot be ethically considered. In these situations theorists refer to the “Rule of Rescue” (Hadorn, 1991).

A better way to define need might be as ‘the capacity to benefit’. In order to estimate the capacity to benefit one must analyse the difference between the current and the achievable health state. A patient with a high potential of gaining in health status should therefore get more proportional healthcare than others. The critics of this theory argue that it doesn’t take the ethical principle of equal human worth into consideration. Using the capacity to benefit principle young and healthy persons would always receive a higher proportion of resources in comparison to old, disabled and chronically ill patients.

A third way of defining need is ‘need as expenditures required to exhaust capacity to benefit’. This theory holds that need can be measured as the expenditure required to reduce the capacity to benefit to zero. According to this theory a need for health care exists until the marginal capacity to benefit is zero (Culyer, Wagstaff, 1993). This definition is better at defining need than ‘capacity to benefit’ but it doesn’t help us in decisions regarding rationing of health care services. There are not enough resources to exhaust the capacity to benefit for everyone.

Maximizing utility

According to the maximizing utility principle, justice requires that health care should be distributed so as to maximize the aggregate population health (Culyer, 1997). This is a principle that is rooted in economic theory. A practical application of this principle is to distribute health care after cost-effectiveness and cost-utility ratios.

Egalitarian principle

This principle holds that resources should be allocated so as to reduce inequalities in health. One argument behind the principle is that everyone is entitled to a similar long and healthy life (Cookson and Dolan, 2000). The principle of equity also makes a difference between horizontal and vertical equity. Horizontal equity requires the like treatment of like individuals. Vertical equity requires the unlike treatment of unlike individuals, in proportion to the differences between them. Equity principles can in many cases stand in conflict with utilitarian theory and several studies indicate that there is a certain equity-efficiency trade-off. For example, Swedish politicians responsible for health care decisions were prepared to sacrifice 15 out of 100 preventable deaths to achieve equity (Lindholm et al, 1998).

To summarize: the above-mentioned ethical principles must probably be combined in a pluralistic approach. Lockwood (1988) argues that the principle of need as initial health (degree of illness) should be combined with the utility principle. Resources should be devoted to patients with the gravest illnesses with consideration to the cost-efficiency ratio, Lockwood proposes. However, it is unclear what weight these conflicting principles should be given when combining them. According to a study by Cookson et al (1999) the public seems to support a combination of all three kinds of ethical principles: need, utility and egalitarian.

5.3 The Swedish priority investigation and legislation

In 1992, the Swedish government initiated an investigatory work with the commission to explore the possibilities of setting priorities in health care. The purpose of the investigation was to: (1) overview the boundaries and demarcations for the health care system in the welfare state; (2) develop guiding ethical principles for explicit priorities; and (3) suggest a general framework for priorities in health care. Behind the governments decision to initiate a priority investigation was the fear of future shortage of financial resources because of the accelerating cost inflation in the health care system. There were also concerns about securing resources for patients with terminal and chronic diseases; patient groups with less ability to speak for their rights.

The priority investigation delivered their final report in 1995: “Vårdens svåra val”, (SOU 1995:5). The report contained a detailed description of the ethics concerning priorities, the legal aspects and proposals for future course and application. The report was referred for consideration to a number of public authorities and expert groups who commented on the report. The priority investigation later resulted in the formulation of three fundamental ethical principles:

- The principle of equal worth. According to this principle human beings are of equal worth and have the same rights. Human rights are independent of personal traits, income, societal status, health status, age, etc. (There is evidently a link to the United Nations declaration of human rights).
- The principle of need and solidarity. Resources should be devoted to areas where need is largest. This principle should be applied both on horizontal priorities (political/administrative level) and on vertical priorities (clinical level). The principle of solidarity emphasises that special attention must be paid to the weak persons in society.
- The cost-efficiency principle. When distributing resources to different health care fields and between interventions one should aim for a reasonable balance between costs and effects measured in terms of improved health and quality of life.

The investigation also suggested that the ethical principles should be ranked in order of precedence because of the risk that they come to conflict with each other. The investigation concludes that it is discriminating and incompatible with the ethical principles to down-prioritise the needs of elderly, premature babies and patients with self-inflicted injuries. However, in the individual case, a decision about medical action should be based on circumstances that limit the benefits of the medical interventions.

In 1997 the ethical principles were converted to the “priority law” (prop. 1996/97:60). The priority law is a supplement (2a § HSL) to the health care law “Hälso- och sjukvårdslagen”. In the final priority law an additional principle was added at the bottom of the rank:

- The right to a medical examination. Every patient who turns to the medical service for help should quickly be offered a medical evaluation, if it is not evidently unnecessary.

The reasoning behind the last principle was that it is not possible to make priorities without first having a medical examination.

The priority investigation recognised the importance of a practical outline for decisions within health services. In the government's bill 1996/97:60 four priority groups are formulated:

Priority Group 1:

- Health care for life-threatening acute conditions
- Health care for diseases that without medical treatment leads to permanent disabilities or preterm death
- Health care for severe chronic diseases
- Palliative care; health care in the final stage of life
- Care for humans with reduced autonomy

Priority Group 2:

- Preventive health measures
- Rehabilitation

Priority Group 3:

- Health care for less acute and chronic conditions

Priority Group 4:

- Care for other reasons than illness or injury

Here follow some comments on the priority groups:

Priority group 1:

It is self-evident that health care for life-threatening and acute conditions in combination with care for potentially debilitating conditions belongs to the highest priority group. The government bill concludes that life-threatening acute diseases break all orders of precedence. Examples of these conditions are among many others: acute myocardial infarction, trauma injuries, pulmonary oedema etc.

Severe chronic diseases can seldom be cured. These patients need health care for symptomatic relief and continual treatment in order to raise the quality of life. Depending on the variable status of these disorders the patient can belong to other priority groups at other times. The priority investigation assesses that these patient groups must be in the highest priority group because they oftentimes lead to grave suffering, preterm death, complications and disability. Examples are: rheumatoid arthritis, multiple sclerosis, Parkinson's disease etc.

The need for palliative care in the final stage of life is large according to the government. Making it possible for people to say farewell with dignity and alleviate pain must be of highest priority within health care. Limited resources may not compromise these measures. Respect for human life shall be ranked higher than cost-efficiency in these matters, the government states.

Care for people with reduced autonomy is also given the highest priority with the motivation that these persons have difficulties to speak for themselves and oftentimes they are neglected.

Without the highest priority for these patients there is a risk for unworthy care. Examples are: unconsciousness, psychiatric disorders, mental retardation etc.

Priority group 2:

Preventive efforts are important for disease control in society and for avoiding complications in persons who suffer from illness. Prevention can be in the form of population programs like vaccinations and screening. It can also involve the individual case, for example hypertension treatment. The government bill clearly states that cost-efficiency is very important for preventive programs since it involves large treatment populations and significant expenses.

Rehabilitation belongs to the second priority group because it is important and oftentimes cost-efficient to secure that people can take care of and provide for themselves. Efforts in this patient group are focused on raising the quality of life. Examples are: stroke patients, artificial prosthesis after amputation and physiotherapy after hip fracture.

Priority Group 3:

This group is by number very large. Health care measures may aim to alleviate symptoms, cure or prevent diseases. In this patient group it can be complicated to evaluate if the symptoms are related to health or quality of life. The government concludes that it is important that people get health care for these conditions, but they should be considered as less serious. Examples of conditions are: allergy, urinary infection and inguinal hernia.

Priority Group 4

Health care in this group should not be financed by public means according to the proposition. These measures are only aimed at improving the quality of life. Examples are: face lifting, impotency drugs and health certificates.

To summarise: it is ground breaking that a principle of cost-efficiency is now part of the Swedish law. However, there are strong underlying considerations to social solidarity behind the Swedish legislation and the formulation of the priority groups. The intention is to balance the ethical and social considerations with the application of economic evaluations. In the next section the theoretical aspects of economic evaluations will be covered.

5.4 Economic evaluation methods in the priority process

The third statutory ethical principle in the priority law is the cost-efficiency principle. The cost-efficiency principle is rooted in the utilitarian justice theory. The utilitarian justice theory holds that it is unethical not to devote resources to those interventions that have the highest efficiency. Because the legislators have decided that resources should be distributed according to need and equity in the first place, the cost-efficiency principle is given the lowest rank in the priority process. However, identifying the optimal allocation of available resources in order to maximize health will play an important role in the future as policymakers are faced by budgetary constraints. As described in the previous chapter, the advances in medicine will continue to deliver an ever increasing number of new methods for diagnosis, prevention, relief and cure. In order to decide what medical interventions should be made available to the public, economic evaluations are needed in the priority process. This section is focusing on

the different economic methods that can be used for treatment evaluation and effective resource allocation.

It is a difficult task to evaluate costs and effects in health care. Many treatments and procedures have effects that are difficult to analyse and sometimes more related to the patients quality of life. There are several non-productive objectives in health care, among which care, comfort and console are important. These variables are impossible evaluate with accuracy because of their subjective nature. Other outcomes are easier to measure, for example; curing, preventable deaths and symptom relief.

Cost-benefit analysis

In a cost-benefit analysis (CBA) both cost and effect are measured in monetary terms. The fundamental idea behind the CBA is to develop an effective resource allocation where a market doesn't exist. In a market, this process is automatic because buyers consume products until the marginal cost fall below the marginal benefit.

From society's perspective, CBA must take all costs and effects into account in the evaluation. Both direct and indirect costs should be included. The effects must include both positive benefits as well as side-effects. The most difficult thing is to value effect in monetary terms. The value of gain in health, expected survival and quality of life is complex to measure. However, a number of methods have been developed to measure the value of health effects; examples of these are the human capital approach, the revealed preferences method and the contingent valuation method.

The human capital approach values health improvements in terms of "the additional economic productivity as measured by earnings in the labour force and the associated decreased health care cost" (Johannesson et al, 1996). The negative aspect of the human capital approach is that it does not take into account the individual's own willingness to pay for improvement in health and quality of life.

The revealed preference and contingent valuation methods measure the individual's own willingness to pay for the effects of a specific program. Therefore the revealed preference and contingent valuation methods are superiorly anchored within economic theory. For a detailed description of these models see Johannesson (1996).

Cost-effectiveness analysis

Because it is complex to measure lives and health in monetary units, the cost-effectiveness analysis (CEA) was developed. Currently it is the most common method in making economic evaluations of health care programs (Anell et al, 2000). CEA values effect in several different non-monetary units, for example, gained life years, avoided deaths etc. Costs are estimated in the same way as in CBA (both direct and indirect costs should be accounted for).

CEA is more practical than CBA, but the simplicity of the method also makes it problematic. Because CEA measure effect in different units it is not easy to compare. The method is also criticised because it only measures one type of effect and neglects all others.

Cost-utility analysis

The cost-utility analysis (CUA) is actually a sub form of CEA. In CUA the effect is measured with quality-adjusted-life years (QALYs). QALY measures effect in terms of gained life years and reduced mortality risk but also in terms of quality of life. Because the effect also measures quality of life, the analysis is called a utility analysis.

QALYs are estimated by assigning every life-year a weight between 0 and 1 and calculating the sum of the weights (Johannesson, 1996). The weight 0 reflects death and 1 corresponds to full health. For example, an individual with a heart disease can value his QALY weight to 0.8. The expected remaining number of life years for this individual is 10. The number of QALYs is equal to 8 (10×0.8).

The best way to assign QALY weights is by measuring individual's health related preferences. This is done by asking hypothetical questions to persons. There are three different models to measure the degree of utility in different health states: the rating scale method, the standard gamble and the time trade-off.

In the rating scale method the study person is confronted with a scale that has a range of 1-100. 0 represents death and 100 correspond to full health. The person's task is to grade his health status on the scale. The value is then converted to a QALY weight between 0-1. The rating scale method is simple and uncomplicated to use in practice. Unfortunately, the situation does not incorporate any choice, so there is no alternative cost or trade-off. The rating scale method is therefore not fully consistent with fundamental economic theory.

The second method is the standard gamble, where the individual has to commit to a safe choice or a risky choice linked to a pay-off. In the safe choice the person is promised a number of years in an unchanged health condition. In the risky choice the person can win perfect health with the probability p , but also the risk of dying with the probability $1-p$. The probability is then adjusted so that the person is indifferent between the safe choice and the gamble. For example, the person with heart disease might be indifferent to gamble if the probability would be 0.8 to win 10 years of perfect health. The QALY weight is then 0.8.

The standard gamble method is in line with utilitarian and economic theory. The study person is set in front of a real trade-off situation. The method takes into account both the individual's utility and preferences. According to utilitarian theory the individual always prefer the alternative that generates the highest expected utility. The disadvantage of the standard gamble method is that it may be difficult to understand for the study person. The gamble involves counting probabilities and the question is unrealistic.

The third method is the time-trade off method. The individual again faces a task to weigh time in different health states and compare them to each other. For example, x number of years with full health compared with y years in a disease state. The number of years with full health is then adjusted so that the individual is indifferent between the alternatives. QALY weights are calculated by dividing x by y . If the study person finds 8 years with full health equivalent to 10 years in the current condition, this results in a QALY weight of 0.8.

To summarise; health economic evaluations integrate clinical and economic data in a framework that makes it possible to compare costs and effects of rival treatment strategies. The economic evaluations can then be used to rank medical interventions. The CBA approach is the most favoured theoretically because both costs and effects are measured in monetary units. However, CB-analyses are scarce because of practical and methodological problems. CEA and CUA are most commonly used but additional information regarding society's willingness to pay and individual preferences are always required.

5.5 Decision rules of cost-effectiveness analysis

This section is going to explain how information from cost-effectiveness analyses can be used to make decisions regarding medical interventions. It is impossible to make correct judgements about treatment's cost effectiveness based on average CE-ratios (Johannesson et al, 1996). In order to decide if the additional benefit from an intervention is worth the extra cost, the incremental cost-effectiveness ratio (ICER) must be calculated. The ICER quote is defined as the ratio between the costs and the effects in the different treatments or interventions.

$$ICER = \frac{\Delta C}{\Delta E} = \frac{C_A - C_B}{E_A - E_B}$$

Let us take a practical example: the treatment of a certain medical condition involves four options, A-D. The options costs and effects are displayed in table 5.1. The alternatives are ranked in order of increasing effect. Treatment C is the least effective, followed by B, A and D.

In table I, the average cost-effectiveness has been calculated for the different options. But we cannot assess what treatment will maximize effectiveness for a given amount of resources. We need to calculate the ICER, which is done in table II. The ICER tells us how much more cost and effect we get for a marginally better treatment option.

Table 5.1 Example treatments

Table I			
Treatment	Cost	Effect	C/E
C	20	10	2.00
B	70	15	4.67
A	50	17	2.94
D	90	27	3.33

Table II			
Treatment	Cost	Effect	ICER
C	20	10	2.00
B	70	15	10.00
A	50	17	-10.00
D	90	27	4.00

Table III			
Treatment	Cost	Effect	ICER
C	20	10	2.00
A	50	17	4.29
D	90	27	4.00

Table IV			
Treatment	Cost	Effect	ICER
C	20	10	2.00
D	90	27	3.53

The next step is to exclude dominated options, i.e. options that are ineffective in relation to others. Dominated treatments will never be chosen, irrespective of the size of the budget. In table II, we can see that treatment B is dominated by treatment A. This is always the case when the ICER-quote is negative between two options. In this case treatment alternative A is more effective than B.

In table III, treatment B has been withdrawn from the program and new ICER-quotes have been calculated. Now it is possible to exclude other options on the basis of excluded dominance. This means that you can combine two treatments in a specific proportion so that

they become more cost-effective than the third. In practice, this is possible if the patient population can be divided into two subgroups. This means that it is possible to combine option C and D in specific proportions so that a higher cost-effectiveness than option A is achieved. In this example optimally 58.8 per cent of the patients would receive treatment C and the rest would get treatment D. With this combination the average result would be a treatment effect of 17, the same as in option A, but the cost would only be 48.8 instead of 50. Treatment A is therefore excluded on the list.

Which treatment should now be chosen, treatment C or D?

Well, in order to decide the treatment of choice one must take two things in consideration: (1) the size of the budget; and (2) the alternative cost (ICER for treatments in other patient groups). When investigating this we are moving into the realm of allocative efficiency. The important lesson from the example above is that by applying the ICER concept it is possible to compare the marginal effects and costs of different treatments and exclude the inefficient ones.

5.6 Achieving an effective resource allocation

There are two different methods for policy makers to apply in the process of resource allocation; (1) deciding on an acceptable CE-threshold; and (2) optimizing a fixed budget. These decision rules can be implemented implicitly or explicitly.

Deciding on an acceptable CE threshold

This method is based on determining the maximum price that we are willing to pay for a unit of effectiveness. This price is called the threshold. In practice this means that we should implement all medical interventions that are below the CE-threshold. For a specific treatment indication we should choose the alternative that has the highest ICER, but still being below the CE threshold.

The acceptance of a threshold CE-ratio can be made explicitly or implicitly. An explicit decision would be for example when a legitimate group of decision-makers announce a specific CE-ratio (e.g. \$/QALY) for which medical interventions will be made available below (Eichler et al, 2004). Implicit decisions are not announced formally but information can be inferred afterwards by studying previous decisions.

There are a number of advantages with explicit thresholds. When the decision rules become more transparent and consistent the public can more easily understand the rationing process. When the decision rules are rational and explicit one can also expect that the rationing process becomes more legitimate. There is also a chance that the population's willingness to pay for health care increases when they realize what cannot be afforded. This was the experience from the Oregon Reform (Ham, 1998). However, the societal preferences of distributing health care according to equity and need make it problematic to adopt a single CE-threshold.

Researchers have therefore distinguished between hard and soft thresholds (Eichler et al, 2004). A hard threshold is a single CE-measure that dictates the decision rules, while a soft

threshold involves flexibility. The soft threshold is a range with a lower and upper boundary. The interval has been given the descriptive name: “smudge”. In this interval the decision makers can make considerations according to need and equity.

Critics against the threshold concept argue that there is a risk for uncontrolled health care expenditures when applying this decision rule. All newly introduced treatments must be financed if they fall below the threshold. In real life a strict CE-threshold does not function because policymakers must balance their budgets, critics argue (Sendi et al, 2001).

Guidance regarding the optimal CE-threshold can be inferred from a number of sources. CE-thresholds can be obtained from willingness to pay analyses, non-medical programs, past medical decisions, and from institutions. Figures in the range of US\$ 50.000/QALY have been mentioned in many studies. This figure originates from the costs-utility of dialysis when it was introduced in the Medicaid program (Hirth et al, 2000). Another common approach is to base the estimate on the Swedish Road Administrations investment calculations for preventing accidents.

Optimizing a fixed budget

Using the method of optimizing a fixed budget, the treatment choice depends on the size of the budget. In order to maximise the health effects of a fixed budget all treatments are ordered in terms of their ICER. The decision rule is to start with the treatments with the lowest ICER and then add other treatments or replace mutually exclusive treatments until the budget is exhausted (Johannesson and Karlsson, 1996). If the budget increases, the affordability for more expensive treatments is raised, i.e. treatments with higher cost efficiency ratios. Depending on the size of the budget, the marginal cost per unit of effectiveness can be calculated. The marginal cost of producing effectiveness increases with the size of the budget.

Summary of economic evaluation and efficient resource allocation

The ICER concept provides an indication of how much more output is given by an additional amount of resources. However, the ICER itself does not indicate if the resources are effectively spent on the treatment under consideration. The ICERs must be compared in order to reveal the efficient alternatives. In addition, consideration must be taken to the size of the budget, which influences what can be spent at the margin. In theory, an efficient resource allocation can be achieved either by setting a CE-threshold or by optimizing a fixed budget. In the next section the priority methods used in practise in Sweden and internationally will be described.

5.7 The priority setting work in Sweden

The government bill 1996/97:60 made it clear that follow-up of the ethical principles in health care operations is important. To secure future follow-up, a national priority delegation was instituted with the task of spreading information regarding priorities among the county councils. The idea was to facilitate the start-up process concerning priorities. The delegation submitted their report in 2001 (SOU 2001:8). From the report it can be concluded that the responsibility for the continuing work with priorities lies in the hands of the health care principals.

During the last few years the work with priorities has accelerated in many county councils. The priority law has spurred this development. There are several actors developing their own methods for setting priorities at different levels in health care. Here follows a presentation of two leaders in the field: The National Board of Health and Welfare and The County Council of Östergötland.

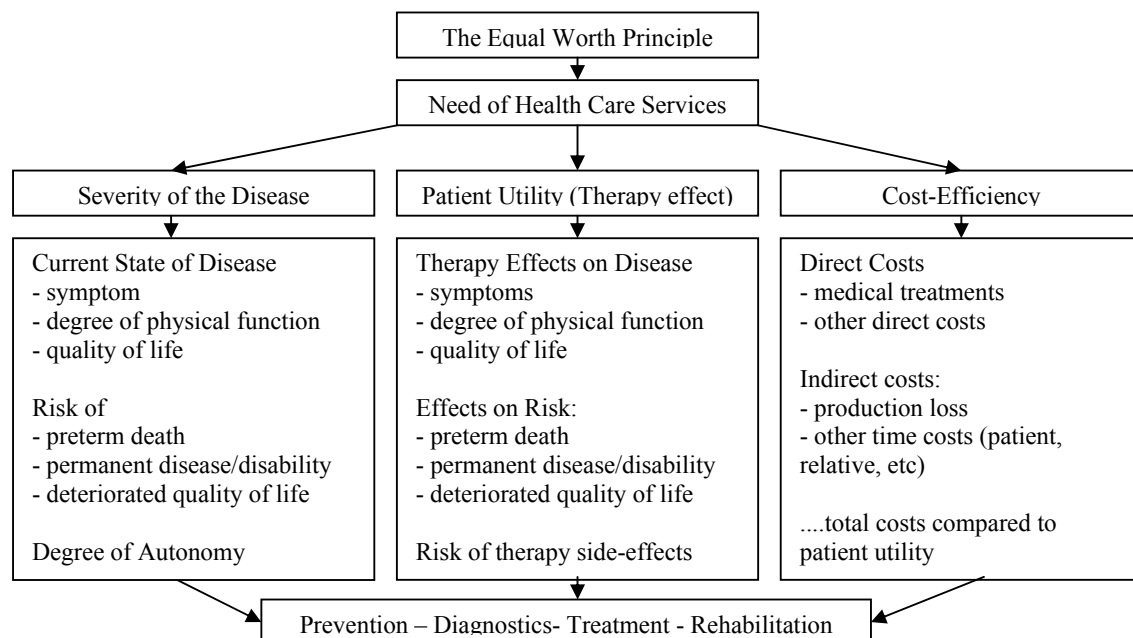
National Board of Health and Welfare

In 1999 the National Board of Health and Welfare (NBHW) initiated long-term work with developing methods for practical application of the priority law in health care. The aim of the authority's work is to contribute to the integration of methods for explicit priority setting at all levels of health care services. Since 1996 the NBHW has elaborated general outlines concerning the care of severe chronic diseases, these are meant to serve as guidance for the entire nation.

The NBHW has developed general vertical priority setting outlines for: heart diseases, asthma, chronic obstructive pulmonary disorder (COPD), venous thromboembolism, stroke, and recently; cancer. The NBHW starts with preparing two background documents: the medical and the health economic facts document. In the medical document the scientific evidence of all medical measures are investigated. In the health economic document the current knowledge concerning cost-effectiveness data for the different interventions are presented.

Figure 5.2 shows the fundamental principles in NBHW's work and the connection with the three ethical principles. The principle of equal worth is superior to all other principles. In the first column the severity of the disease is estimated together with the risk of preterm death and complications etc. One can interpret the first column as representing 'need'. In the second column, the disease condition is matched with a specific treatment or intervention. The utility

Figure 5.2 Principles for setting vertical priorities



Source: The National Board of Health and Welfare

or the effect is documented in this step. The final step, represented by the third column labelled cost-efficiency, involves calculation of the costs associated with the disease and the intervention. The cost effectiveness is classified into four levels; (1) high: 500,000-1.000,000/QALY; (2) middle: 100,000-500,000/QALY; and (3) low: <100,000/QALY; or (5) not measurable. Evaluations are made in all areas: prevention, diagnostics, treatments and rehabilitation.

There is a risk that Figure 5.2 can be misleading. One might interpret that the utility of the intervention is measured at two separate occasions. First the utility of the treatment is evaluated in the second column and then also in the third column which is labelled cost-efficiency. In order for the cost-utility evaluation to be theoretically correct all costs and effects must be taken into account and this can only be done once. I suggest that the third column rather should be labelled as 'costs' (direct and indirect) and a new box would be drawn below where the cost-utility is calculated.

After the background documents have been prepared, the NBHW begins to rank, on a scale from 1-10, the different medical actions and procedures in pairs of conditions and treatments. Number 1 is given the highest priority and 10 the lowest. The NBHW emphasize that the idea is not to make national decisions about rationing of some medical services. The list should instead serve as a source of information for political decisions later on.

The County Council of Östergötland

The region has been struggling with a series of consecutive budget deficits during the last 15 years. To avoid severe budget deficits in the future the county council needed to formulate a strategy to control costs. The intention was to increase efficiency through structural changes and by setting priorities. On the first hand the county council wanted to achieve productivity gains and on the second hand commit to rationing of health care services (Bäckman et al, 2004). The county council of Östergötland began working with vertical priorities in health care in the early 1990's. During these years the county council has elaborated a systematic and practical priority process.

In 2000 the county council established a national centre for priorities and medical program work. The priority centre was given the commission by the NBHW and the Federation of Swedish County Councils to develop practical methods for priorities. The priority centre has built up a reference database for Swedish and international literature and is actively producing reports concerning ongoing projects in Sweden. The centre has analysed what basic facts are needed for the priority process and investigated which factors can be major obstacles.

In 1996 the county council started making medical program documentations for major disease groups. The medical program documentation involved the entire health care service chain from primary care and municipal services to regional hospital services. Engaged in the documentation were politicians, community workers, medical professionals and administrators from the regional social security office (Kernel-Tolf et al, 2003). The program documentation was to answer the questions NBHW outlined in figure 5.2.

With the information from the program documentations, a vertical priority list was established within each disease area. An example of the design of a vertical priority list is enclosed in appendix 2. For each condition/treatment pair the patient need, treatment effect, cost/QALY and degree of evidence is stated. The condition/treatment pair is finally given a rank between 1-10. The decisions regarding horizontal priorities are then left to the politicians. Conditions and procedures that lie at the bottom of the different ranking lists can then be compared to each other. On some occasions, before the final decision about rationing a service, additional consequence analysis have been requested by the politicians (County Council of Östergötland, 2004).

In 2003 the county council in Östergötland was hit by a financial crisis. It was necessary to cut cost by 300 MSEK in 2004. The medical directors were assigned the task to make a consequence analysis of a 10 per cent budget reduction within each medical field. The purpose was to use the vertical priority ranking lists for real. In October 2003 as the first county council in Sweden, Östergötland took decisions to limit supply in a number of low-priority services in regular care. Preparations for these decisions had been ongoing for several years. A lot of time and work had been invested to analyse the process in terms of accountability of reasonableness. It was important that the process was perceived as fair and legitimate in the eyes of the regional population (Bäckman et al 2005)

The priority decisions of 2003 consisted of changing the health care services in a total of 72 different conditions or procedures, estimated to result in a cost reduction of 37,7 MSEK. Starting with these 72 decisions, 56 were implemented in practise. Table 5.3 shows the distribution of the decisions between different medical specialties. The priority decisions concerned: (1) total exclusion of some services (40 %); (2) more strict indications for some procedures (17 %); (3) transferral of services to a lower health care level (38 %); and (4) higher patient fees (5 %). The average cost saving per decision was 500,000 SEK (Bäckman et al, 2005).

Table 5.3 Number of priority decisions in Östergötland in 2003

Disease group	Decisions	Implemented
Ophthalmology	8	7
Ear nose and throat	9	4
Heart diseases	6	2
Vascular diseases	8	7
Orthopaedics	3	3
Gynaecology	13	11
Urology	7	3
Children's care	17	17
Gastroenterology	5	2
Total	76	56

Source: Bäckman et al, 2005.

In 2004 the county council continued the priority work by making horizontal priorities. The county council used the guiding ethical principles and the ranking lists and managed to disinvest financial resources for psychiatry, oncology and long term care. The release of resources was accomplished by four new vertical priority decisions.

The county council in Östergötland has been successful at implementing a pragmatic method for priorities. They are far ahead in relation to other regions in Sweden. During the last few years the priority process in Östergötland has been intensely followed in national media. It is considered as an important historical turning point for Swedish health care. But in economic terms the priority process has not had more than marginal effect. In relation to the total county

council budget in Östergötland of around 7 billion SEK, a cost reduction of 38 million in 2003 is not much. It has also been difficult for Östergötland to achieve cost reductions when studies have shown underinvestment in other medical areas.

5.8 Priorities internationally

Many other countries have developed principles for setting priorities in health care. The choice of method differs between countries, depending on a multitude of factors. In theory, the priority methods can differ at the following points: (1) ethical decision rules (utility or need); (2) level for priority decisions (political, administrative, clinical); and (3) purpose (cost reduction, promoting efficiency). Most differences between countries priority methods can be derived from their respective health care system organisation and underlying social values regarding equity and justice. Here follows a brief description of some contemporary priority efforts in Oregon (USA) and in Norway.

The Oregon Reform

In the US, health care is financed via three major sources: (1) the private insurance system; (2) Medicare (publicly financed health care insurance for elderly, chronically ill and disabled); (3) Medicaid (publicly financed health care insurance system dedicated for persons below the federal poverty income level). The two publicly financed systems together cover approximately 30 per cent of the US population and account for 40 per cent of national health care expenditures (Fuchs et al, 2005).

The triggering event behind the Oregon reform is said to be the case of Coby Howard, a 7-year-old boy diagnosed with leukaemia in 1987. Howard needed a bone marrow transplant and his parents did not have a private health care insurance. The Oregon legislature for Medicaid, had earlier decided that transplant operations were not afforded. In the federal Medicaid program, a bone marrow transplant is an optional service at the discretion of the states. The Oregon state refused to pay for Coby's transplant. The case was observed by national media and a private fund collection was started to finance the operation, but Coby died before sufficient money had been raised.

After Coby had died, Oregon state legislature restored funding for bone marrow transplants. However, the problem in Oregon was that the costs for medical treatment had increased so much during the previous years. The result was a severe scarcity of financial resources in the Medicaid program. A substantial segment of the Oregon population was uninsured and lacked coverage, even for the basic financial services. 42 per cent of the population below the federal poverty line lacked Medicaid coverage (Oberlander et al, 2001). Oregon could not afford to pay for all medical care service for every person. A doctor (who later became a politician) came up with the idea that Oregon could expand the coverage of the insurance and control the expenditures if they started to ration care.

The authorities started constructing a systematic priority model based on the ethical principle of utility maximization. The model consisted of comparing cost/utility analyses for all diagnoses with corresponding treatments. These analyses were complemented by inquiries about the opinions in the population, patients and medical professionals. The rankings were generated by a complicated mathematical formula, integrating and weighting all relevant data

(Oberlander et al, 2001). It was considered as a successful “marriage” between health economics and democracy.

The reform began operation in 1994, after being approved by the Clinton administration. The new Medicare program was going to be financed according to a ranking list of 709 condition/treatment pairs, a reduction from over 10.000 medical procedures. The condition/treatments highest on the ranking list were the cheapest and most effective. The idea was to draw a line on the list according to how many services the budget was calculated to cover. The state was not going to pay for any service below the line. There was a lot of controversy regarding the ranking list because some medical procedures lacked sufficient cost-effectiveness data and were given illogical ranks. To mention an example: acute appendicitis surgery was ranked lower than replacing the crown of a tooth (Jönsson et al, 2004). The committee in charge had to rewrite the list a number of times and replaced the ranking method with subjective and politically biased decisions (Oberlander et al 2001).

The reform in Oregon increased the enrolment to the Medicaid program with an additional 130.000 people and contributed to a reduction of those who were uninsured from 18 per cent of the population in 1993 to 11 per cent in 1996. However, the expansion of enrolment created a backlog of need that resulted in a budget deficit of \$18 million in 1994 (Ham, 2006).

It seems like the Oregon reform was not very successful in preventing the health care cost expansion. Oberlander argues that the following conclusions can be drawn after evaluating the Oregon reform after 10 years of operation: (1) the extent of rationing of health care services has been very limited both from a medical and financial perspective. The program was in 2001 more generous than under the state’s old system. Only a few medical procedures were not financed by the Medicaid. (2) The financing rules have not been implemented consistently. People continue to get services ranked below the budget line because physicians are not abiding the rules and the state is still paying for the rationed services. (3) The reform has not produced significant cost savings. (4) The mathematical ranking method has to a large extent been replaced by subjective decisions of the health-care commission after pressure from lobby groups and the federal government.

From a Swedish perspective, the Oregon model reflects both the American values and their health care system. The method is based on the utilitarian value theory, which means that utility should be maximized by the use of cost-effectiveness analysis. Equity and need is not under much consideration in the priority process. However, some element of the public opinion and preference is incorporated in the model. Of course, the experiences from the Oregon reform can serve as reference and source of information for the Swedish priority work.

Norway

Norway was the first country in the western world to introduce national guiding principles for priorities in health care. The most cited explanation behind the priority process initiative is the discovery of the oil fields in the North Sea in the 1970’s. Due to the massive income from the oil fields the government feared that increased spending would result in inflation with all its

drawbacks. This situation created a need for forward looking strategies and a public policy towards the cost expanding public sector (Calltorp, 1999).

In 1985 a national priority commission was established with the former rector of the University of Oslo, Inge Lønning as chairman. In 1987 the Lønning report (Lønning 1) was presented. The commission had elaborated five priority level including one “zero” level. The priority levels were ranked according to need and severity of disease. The zero level contained treatments with the lowest effect and least severity of disease. Level 1 included ‘life-threatening conditions’, level 2 referred to ‘serious and chronic diseases where withholding treatment would lead to catastrophic consequences’, level 3 covered ‘treatments for chronic disorders with a proven benefit’, while level 4 contained ‘treatments with unproven benefit or marginal benefit for less severe conditions’ (The National Board of Health and Welfare, 1999). The priority groups were introduced into the Norwegian law in 1990. Level 1 was guaranteed health care immediately and level 2 within 6 months. Level 3 and 4 were left unregulated.

The aim of the Norwegian model was to serve as guiding principles for priorities on the political/administrative level. Critics argue that the model was too simple and did not bring any new information or guidance. In 1996 Norway decided to renew the investigation and set up a new commission with the same composition. The objective was to evaluate the implementation of Lønning I and to develop better techniques for priority setting.

In 1997 the Lønning II report was presented. The report concluded that the priority principles had not been implemented nor produced any effect in practice. The investigation also found that the psychiatric care was under-funded in relation to other health care fields (Calltorp, 1999). This led to the formulations of a new set of guiding principles: (1) a basic health care package – a detailed description of severe diseases, treatment outcomes and cost effectiveness. These services should be fully covered by the public insurance system. (2) Additional health services – less serious conditions and less effective treatments. This category should be financed as far as possible by the national state. (3) Low priority services – examples are in vitro fertilization and cosmetic surgery. For these interventions, a mix of private and public financing could be considered. (4) Zero priority group – this category should not be financed by public means.

Pedersen et al (2004) concludes in the Norwegian Medical Journal that although the priority debate has been around for more than 15 years nothing is happening. They argue that it is necessary to continue the priority work and implement the principles in practice. It is important to secure resources for those with the greatest need.

6. Analysis

6.1 Priorities and cost containment

As described in the first sections of this thesis, the costs of health care have been growing steadily for decades. During the 1990's this cost development was to a large extent solved by structural reforms and by implicit priorities between interventions and medical sectors. The expectation for the future is that the cost expansion in the health care sector is going to outpace the growth of the Swedish national economy. There are multiple reasons for this trend. The advances in medical technology will make available new expensive interventions and procedures in the future. A contributing factor is the raised longevity of the population with an associated demographic shift that will create an increased need for medical services. The improved level of education and information technology will increase the population's knowledge concerning medical possibilities, with higher expectations and demands as a consequence. The Federation of Swedish County Councils forecasts the future health care expenditures to increase by 1.6 per cent per year until 2030, whilst the growth in public financing is limited to 0.5 per cent per year. The slow growth of the county council's finances is due to a smaller proportion of the population in working age and a limited growth of GDP per year.

The main objective of this essay is to investigate what role the priority process can play to limit the financing problems for Swedish health care in the future. It is not within the scope of this thesis to answer how productivity gains and increased effectiveness can be achieved through structural reforms and organisational changes. However, it is not likely that productivity gains and structural changes can solve the future financing situation solely. High expectations have been placed on the priority process' ability solve the financial problems. What effects then can we expect explicit priorities to have on cost containment in the health care sector in the future?

The lesson that can be learnt by studying the effects of the Oregon reform is that explicit priority setting can result in inflation of health care services and costs. In retrospect the Oregon reform was successful; the number of people eligible for the Medicaid program increased and the number of services the insurance covered expanded. However, the explicit priority decisions generated an intense public debate about the services that were rationed. The priority process in Oregon attracted a lot of attention from national media and the rationing decisions lead to public controversy as they were challenged by individuals, interest groups, organisations and companies. The consequence of this was that funding increased and the population's willingness to pay for health care was amplified (Ham, 1998).

From a cost saving perspective, the priority process in Östergötland has only had limited significance so far. For 2003 it has been estimated that the priority work resulted in cost reductions of 37.7 MSEK. During the financial crisis in 2003 the county council was forced to cut costs by 300 MSEK. In comparison to the county council's needed cost savings and the total budget of 7 billion SEK, a cost saving of 38 million can be perceived as marginal.

6.2 Priorities and effective resource allocation

The key to the priority process is the introduction of CEA and CUA in an explicit decision making process. Introducing CE thresholds or league tables will help redress allocation inefficiencies by comparing rival interventions in a systematic way against each other. In this way, CE analysis contributes to the priority process by making the resource allocation rational to the population. Making the decision process for priorities explicit and systematic will also lead to increased legitimacy and transparency in the health care system.

The potential gain from the application of economic evaluations is high. For example, Bobadilla et al (1994) studied the effects of introducing health economic decision methods for allocating resources in East Africa. The result suggests that by reallocating 50 per cent of the health care budget to interventions that are the most cost-effective, a 64 per cent increase in the number of life years saved could be attained. Of course, this study concerns a developing region, and we cannot expect the same effect in Sweden. However, the potential allocative benefits of introducing economic evaluation methods are highly promising for Sweden also.

In order to implement CE-analysis as a golden standard in all clinical operations it is necessary that the knowledge concerning direct and indirect costs from different interventions is investigated further. However, it is not only the costs that are unknown for many medical treatments. In addition, the medical effects are oftentimes unclear, both the positive effects and the side effects. Further on, it is necessary that these medical effects can be quantifiable and measurable on a population basis. In many medical specialties this is going to be a big challenge for the future. In health care there are factors that are complex to evaluate, including the need for care, comfort and console.

In practise is it difficult to achieve an optimal resource allocation. "Public willingness to forgo an existing program is generally lower than the willingness to pay for a new program yielding the same benefit. This has been fittingly described as the "kink in consumer threshold value for cost effectiveness in health care" (Eichler et al, 2004). For many reasons, including; political, ethical and psychological it is not feasible to base the priority process only on league tables or CE-thresholds. There is also a risk that strict adherence to CE-thresholds can create anomalies and illogical allocations of resources like in the Oregon experiment.

Another difficult task is to decide on a CE-level that the population will accept. One study by Rosen et al (2002) indicates that 59% of the Swedish people are of the opinion that public health services should always offer the best possible care, regardless of costs. It is impossible to draw any definite conclusions from statements like this but it seems like the public is not very fond of rationing decisions in health care.

To summarise: setting priorities in health care will play an important role in the work towards efficient resource allocation in health care because it implements CE analysis. However, CE-analysis must be used with caution because ethical and social preferences must be taken into consideration as well.

6.3 Vertical priorities at work

In the case of vertical priorities, it is important that the economic decision principles are used in a systematic way in medical practise. In the clinical setting it is the doctor who makes decisions according to the current best available knowledge. This has become known as “evidence based medicine” (EBM). EBM denotes a certain level of scientific knowledge that shall be available for accepting a medical intervention. For example: evidence should be acquired through randomized clinical trials. The central tool for EBM is the clinical practical guidelines (CPG) which contains evidence based recommendations of interventions to use.

The implementation of practical EBM has become closely linked with cost control because opportunity costs must be considered when deciding if a medical intervention should be recommended in the CPG (Saarni and Gylling, 2004). The consequence is that cost-effectiveness analysis has become an essential element in formulating the CPG. Thus, the CPG must take into account both the degree of scientific medical effectiveness and relate them to direct and indirect costs.

Policy makers have discovered that the CPGs can be a powerful tool in introducing priorities in clinical practise. In Sweden, a few examples of clinical practical guidelines have become distributed. One example is “Kloka Listan” for pharmaceutical drugs. Kloka listan is a CPG-pamphlet where drugs are ranked in order of recommendation, including considerations of cost-effectiveness. For each diagnosis a first, second and sometimes third recommendation for medical treatment is given. The Kloka listan is formulated by a pharmaceutical committee instituted in each county council.

One can consider practical EBM as a form of priority setting method because cost considerations are inevitable in the formulation of CPGs (Norheim, 1999). As a result of the implementation of the CPG, some potentially beneficial medical interventions are not being used in practice due to their costs.

I argue that the implementation of cost effectiveness analysis in the CPG is an important mechanism for operationalising these economic evaluation methods. Doctors are the ones that make the decisions regarding medical interventions in practise and there is a risk that they are persuaded by other parties to make irrational decisions. Commercial marketing by medical companies and the patient’s demands are two examples of how the doctor can be influenced to make an irrational decision in respect to cost-effectiveness. Nevertheless, it is important not to underestimate the influence of the medical profession on health care costs. The European Union (2001) describes the situation like this: “Health Care is an atypical economic sector because the supply side – i.e. the doctors – largely determines the demand, sometimes to the detriment of systematic evaluation of the real health benefits of innovations and their cost to the general public.”

The implementation of CPGs in medicine is not without negative aspects. Using binding guidelines there is a risk that the art of medicine is reduced to “cookbook medicine”. It is necessary that the doctor has a high degree of autonomy in decision making since practicing medicine is complex, and there is much more than opportunity costs that must be under consideration. These circumstances put the doctor in a conflict of interest. Should he/she act

according to the Hippocratic medical ethics or should he/she consider the insurance party's financial budget constraints. The Hippocratic medical ethics states that the doctor should do the best for the individual patient in all circumstances. Applying this principle in practice means that costs should not be the highest importance. But the consequence is a lack of money for other patients; i.e. resources are not efficiently allocated. There is a prominent split between societal versus patient benefit here.

The financial crisis for the health care sector is a growing problem and it is important that the doctors and policymakers find a way to combine the interests of the patient and the third financing party. It is not possible to exactly steer the decisions of the individual doctor but on the other hand, it is important to achieve a better resource allocation. The best compromise, I believe, is to make clinical recommendations and avoid binding guidelines. Setting clinical priorities is a complex but utterly important project. The implementation of priority setting guidelines via the EBM approach is probably the key mechanism to ensure efficient resource allocation on the treatment level. It is during the meeting between the patient and the health care provider that health care services are produced. It is also in the clinical setting that most decisions regarding medical treatments and interventions are made. I conclude that the implementation of recommending CPGs can contribute to the efficiency of the Swedish health care system. The CPG is probably an underutilized tool for setting priorities in clinical practice. It is necessary to move from policy to practice in these matters.

6.4 Priorities and the introduction of new technology

Traditionally, new innovations in medicine have only been assessed on the degree of clinical evidence, i.e. focus has been on whether the technology has an effect or not. The famous health economists Victor Fuchs (1986) has written about the “technological imperative in medicine” that is driving up the costs of health care. This means that the doctor is bound by the medical ethics to intervene, act, and do anything for the sake of the welfare of the patient. Unfortunately, this has been an uncritical process driving up the costs for health care and not promoting an allocative efficiency.

If the priority process is going to lead to an optimal allocation of resources when introducing new technology it is necessary that the marginal health gain per \$ is equal for all investments. There should be a systematic process of health technology evaluation conducted when new medical interventions are being introduced on the market. I suggest that this assessment process should use the same established methodology as in the case of CE-analysis.

In Sweden there are several institutions that conduct health technology assessment (HTA). The Swedish Medical Products Agency assesses the efficacy of new pharmaceuticals. The Pharmaceutical Benefits board is also involved in this process by requiring the pharmaceutical companies to demonstrate cost-efficiency of their products in order to get them subsidised by the agency.

The Swedish Council on Technology Assessment (SBU) is another national agency that makes critical reviews of the effectiveness of medical technologies. SBU prioritizes interventions for assessment on the basis of the economic impact, ethical complications and the degree of implication on the health care system (Carlsson, 2004).

The problem with HTA in Sweden is the insufficient amount of resources available for assessment of new technology. As a result, just a small proportion of the many hundreds of interventions available can be assessed regarding cost-effectiveness. The consequence is a severe lack of data concerning costs and effects for several medical interventions. Many interventions have traditionally been introduced without the reliance of randomized clinical trials.

One can speculate if the review of medical technology should be done in a more pragmatic way and include other factors than CE-analysis. By leaving the strictly scientific approach the assessment agency can use the best available data and incorporate social, ethical and political considerations. However, the problem is that the assessments would become too normative and irrational if they become based on value judgements. As a result, there is a risk that the assessment agency would lose in legitimacy.

The effects of HTA on the priority process in Sweden cannot be considered more than marginal in the past (Carlsson, 2004). However, with the introduction of the Pharmaceutical Benefits board, established in 2002, there is an ongoing systematic review of the entire pharmaceutical assortment in Sweden. A number of decisions regarding pharmaceuticals that no longer will be subsidized have been taken lately (Pharmaceutical Benefits Board, 2006). I believe that HTA will have more impact on the priority process and policymaking in the future.

6.5 Priorities and equity

Considerations about equity and justice in the distribution of health care must be included in the priority decision process. It is well established in previous studies that a certain trade-off exists between equity and efficiency (Johannesson, Gerdtham, 1996). The policymakers in Sweden are also willing to sacrifice efficiency in order to achieve equity (Lindholm et al, 1998). What is missing in Sweden is a debate about how large equity-efficiency trade-off we can accept. On the first hand, one must consider that it is unethical to spend resources on inefficient treatments when there is an alternative more efficient use. On the second hand, this leads to a distribution of health care that the public cannot accept.

Increased equity can be the result if the priority process is implemented in a systematic way on a national basis. Today, there are significant differences between county councils regarding what services are offered. If a national priority guideline would be implemented, these differences would become less significant. One example is the treatment of breast cancer in Sweden. In some county councils, the monoclonal antibody trastuzumab (Herceptin), which is evidence based treatment against breast cancer, is not afforded to patients due to lack of resources. However, in April 2006 the NBHW released their national guiding principles for oncology where it was stated that Herceptin should be offered to women with relapse in their cancer disease (The National Board of Health and Welfare, 2006).

One can conclude that it is important for equity purposes the priority process is conducted on a national basis. Today the priority work is very fragmented and it is up to each county

council to take a decision. Rationing health care in one county council can also become worthless, from society's perspective, if the patient has a free choice to demand health care services in other county councils.

6.5 Priorities and the health care system

There is a risk that the priority process might slow down a theoretically necessary reformation of the Swedish health care system. By rationing health care, the county councils have invented a tool for avoiding structural changes that are politically controversial. It is sad if the health care principals choose to fight the cost expansion by rationing health care instead of taking measures that increase productivity and efficiency in the organisations. Rationing of health care can become counterproductive if not used properly and without the economic evaluation methods that safeguard an efficient resource allocation.

It is commonly known that the degree of competition between Swedish health care providers is limited due to significant regulations. As described in chapter 1, there are both equity and efficiency reasons behind governmental intervention. However, there are significant challenges for these public health organisations in making the implementation of priorities successful. An important question is what kinds of incentives are required for the priority activities to become widely spread. It is probably necessary to align the priority process to the reimbursement system, in order to correct mismatches in incentives. The current financing system has certain negative consequences as it motivates county councils to signal financial shortage in fear of receiving less of state subsidies or reallocation taxes. I argue that the proper motivation must exist in order for the priority process to be optimally used for cost saving purposes.

The current health care system in Sweden is not accustomed to making trade-off decisions and reallocations. One major challenge is going to be how to make disinvestments. It is important that policymakers take into account the economic fundamentals of comparing the marginal benefit lost from scaling back a service with that of scaling up another. If resources cannot be disinvested the use of marginal analysis in budgeting is lost.

7. Conclusions

In theory, the priority process has access to the necessary economic instruments for maximizing health outcome for a given amount of resources. By introducing CE-analysis in a systematic way the priority process will promote efficient resource allocation. The work towards allocative efficiency is cost-containing because ineffective treatments and interventions are removed and only the cost-effective interventions remain. A systematic implementation of priorities could theoretically have a tremendous cost-containing and health maximization potential.

In practice, the priority process faces a number of challenges that may impair the systematic use of economic evaluations across health care sectors. Here follow a brief summary of the major hurdles to the priority process:

Organisational challenges:

- The reimbursement and tax allocation systems must favour the implementation and use of the priorities. Today, county councils are competing with each other to receive subsidies from the state. There is a penalty associated with being cost-efficient.
- The majority of county councils base their resource allocation on a fixed budget approach. Priorities are not implemented in practise if there is no reward to be efficient. Mismatches in incentives are present.
- The key in resource allocation is to be capable to disinvest. Shifting resources to those that are highly cost-efficient by scaling back on others. This can be difficult especially if it involves staff reassignments and discharges.

Barriers in clinical use:

- The medical profession is more interested in clinical effect than cost effectiveness.
- Economic evaluation methods must be used at treatment level. Ignoring individual decisions has heavy impact on the efficiency of the health care system.
- There is a conflict of interest between what is best for society and what is best for the patient. This discrepancy is likely to widen as a result of technological advances in medicine. This can lead a dualistic system with doctors who follow traditional ethics for wealthy patients and doctors who are impaired by budget restraints to give the second best cost-efficient treatment for poorer patients.

Challenges with the public:

- Explicit priorities and rationing can lead to public controversy. Rationing decisions will be questioned and challenged by individuals, patient groups and organizations. It can be a tough job to convince the public, this was the experience in Oregon.

Ethical challenges:

- Ethical considerations are necessary but impair the strict use of CE-analysis. It is impossible to base the priority decision process on strictly CE-analyses. A discussion regarding the acceptable equity-efficiency trade-off is needed.

The introduction of new technology

- Even though a new medical technology increases the cost-effectiveness of treating a specific diagnosis, the patient population base is oftentimes expanded by the implementation of a new method. The result is an upward pressure on health care expenditures.
- Health technology assessment must be used systematically in policy making and the necessary resources for economic evaluation must be made available.

Methodological challenges:

- There is a lack of data regarding cost and effects for many treatments and interventions. Old treatments oftentimes lack cost-efficiency data. But for new technologies, companies are required to demonstrate cost-efficiency. This results in an imbalance in the availability of cost-efficiency studies between different interventions.
- The lack of data for interventions makes it impossible to make theoretically correct resource allocation decisions across an entire health care sector or even for a single disease area.
- Different CE-analyses can be difficult to compare because of the lack of a single standardized unit that measures effect. This leads to inconsistencies and problems when comparing studies.

The challenge of time and cost

- Cost-efficiency studies are costly and time consuming.
- Priority ranking lists need to continually be updated. New medical evidence regarding costs and effects are produced rapidly. However, it takes a lot of time to update ranking lists and for the politicians to decide. There is a risk that health care providers become slow at introducing new techniques and methods.

I argue that the above mentioned factors are counteracting the potential of scientifically optimizing health care resource allocation across whole health care sectors. The consequence is that the cost containing effect of the priority process cannot be used to its full potential. This makes it unlikely that the priority process by itself is capable of solving the expected gap between needed and available resources for the health care sector in the future.

However, the need to make choices in health care is evident and the techniques of economic allocation have conceptual attractiveness for practical use. In order to function in reality, the priority process in Sweden has incorporated a pragmatic decision method. This means that economic evaluations are combined with normative decisions methods which include consideration to distributional equity, need and social preferences. The comprehensive picture is that priority activities in health care bring positive effects, both regarding equity and efficiency. It is therefore important that the work with priority setting is continued with special focus on reducing the barriers that limit their use.

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**Appendix 1. Detailed survey of outlays on medical care and health,
Source: Statistics Sweden**

<i>Current prices</i>	<i>Million SEK</i>						
	1993	1995	1997	1999	2001	2003	2004*
Household consumption expenditure							
<i>Medicines</i>	4 061	4 724	6 489	7 161	8 208	8 518	8 813
<i>Other pharmaceutical products</i>	187	201	197	210	233	232	251
<i>Spectacles etc.</i>	2 951	3 129	3 352	4 003	4 461	5 021	5 131
<i>Patients' fees</i>	8 862	10 303	10 752	12 096	14 970	17 376	18 581
<i>Total household consumption expenditure</i>	16 061	18 357	20 790	23 470	27 872	31 147	32 776
Government consumption expenditure*							
<i>Medical care and health</i>	102 104	108 138	114 556	128 172	146 750	167 732	172 107
<i>Of which: Social benefits in kind produced by market producers</i>							
<i>Medicines</i>	10 167	13 033	12 761	17 123	18 193	20 244	19 982
<i>Doctors and dentists in private practice</i>	4 634	2 129	1 449	995	941	1 874	2 315
<i>Agreements with private nursing institutions</i>	3 577	6 693	7 850	9 364	17 810	22 679	19 416
<i>Total government consumption expenditure</i>	102 104	108 138	114 556	128 172	146 750	167 732	172 107
Total consumption	118 165	126 495	135 346	151 642	174 622	198 879	204 883
Gross fixed capital formation							
<i>Market producers</i>	692	884	1 210	1 551	2 344	2 269	2 400
<i>Government</i>	4 865	5 860	6 131	7 725	6 450	7 479	6 996
Total gross fixed capital formation	5 557	6 744	7 341	9 276	8 794	9 748	9 396
Total expenditure	123 722	133 239	142 687	160 918	183 416	208 627	214 279
for medical care							
BNPm GDPm	1 557 060	1 787 889	1 904 656	2 096 363	2 288 351	2 459 413	2 573 176
<i>Medical care and health as per centage of GDP</i>	7,9	7,5	7,5	7,7	8	8,5	8,3

*The figures for 2004 are preliminary

Appendix 2. Example of a vertical priority ranking list for heart diseases from the county council of Östergötland. Source: (Bäckman et al, 2006)

Disease condition Procedure	Disease severity/ Need for therapy	Treatment Effect	Cost/Gained QALY	Evidence	Rank
AV-block III (including congenital conditions) <i>Pacemaker implant</i>	High risk of preterm death. High risk of permanent suffering. Low-high need of relief of symptoms. Low-high affect on life quality.	Large reduction of risk of preterm death Large reduction of risk of permanent suffering Low-high symptom relief Low-high raise in life quality	Low (estimated)	Well experienced	1
Acute coronary disease with/or recently experienced revascularisation Physical training (team based)	Various risk of preterm death and permanent suffering Various need of symptom relief Various affect on life quality	Moderate-high reduction of risk preterm death. Moderate-high reduction of risk of permanent suffering. Moderate-high symptom relief. Moderate-high increase in quality of life	Low	Evidence degree 1 of effect. Favourable health economic evidence.	3
Cardiac valve Disease in patient with other simultaneous severe disease or condition with expected short survival Preoperative evaluation and if possible surgery	High risk of preterm death. Moderate risk of permanent inflicted damage Variable need of symptom relief. Variable affect on quality of life	Little gain concerning preterm death and/or permanent suffering depending on underlying disease High risk during surgery Variable relief of symptoms Effect on life quality difficult to estimate	Very high (estimated)	Well experienced	9