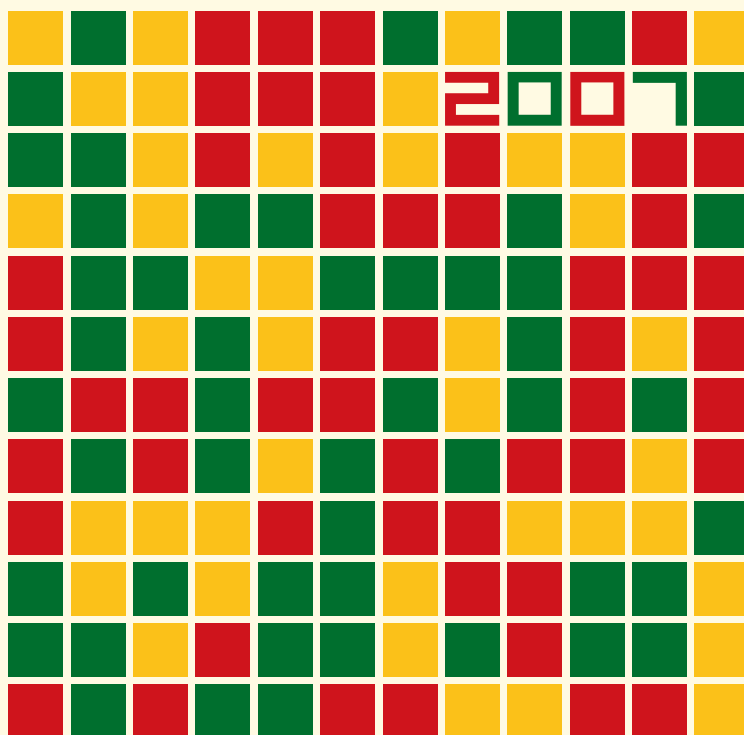


Quality and Efficiency in Swedish Health Care

Regional Comparisons
2007



Swedish Association
of Local Authorities
and Regions



Socialstyrelsen
THE NATIONAL BOARD OF HEALTH AND WELFARE

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Preface

This is a slightly abridged version of the second healthcare report in a series entitled *Quality and Efficiency in Swedish Health Care – Regional Comparisons*. The series compares healthcare quality and efficiency in the 21 Swedish county councils and healthcare regions by using a set of national performance indicators. The first report was published in 2006 and the second in October 2007.

The purpose of publishing comparative data about healthcare performance is two-fold. First, the comparisons are a way of informing and stimulating public debate on healthcare quality and efficiency. The public, as both patients and citizens, has a right to know about the results of the healthcare services that are available to it.

The second purpose is to stimulate and support local and regional efforts to improve healthcare services in terms of clinical quality and medical outcomes, as well as patient experience and efficient resource use. In county councils and healthcare regions, political representatives, managers and staff of primary care clinics and hospitals can use the comparisons to locate and pinpoint the strengths and weaknesses of their healthcare systems. Comparisons are a powerful way of driving performance improvement.

This series of healthcare comparisons is a joint, long-term project of the Swedish Association of Local Authorities and Regions (SALAR) and the Swedish National Board of Health and Welfare (NBHW). Future publications are planned based on the original set of indicators but expanded with respect to the areas of health care that are covered.

The steering committee for the 2007 report was composed of Roger Molin and Stefan Ackerby from SALAR and Anders Åberg and Mona Heurgren from the Centre of Epidemiology at the NBHW.

The working group for the report consisted of Max Köster and Rickard Ljung from the NBHW and Lena Bäckström, Bodil Klintberg and Jesper Olsson from SALAR. Karin Nyqvist from the NBWH was responsible for the appendix of indicator definitions. Lena Eckerström from SALAR and Fredrik Westander, a consultant, served in coordinating roles.

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Director General, Swedish
National Board of Health and Welfare

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Introduction

Sweden – a decentralized health care system

In Sweden 21 county councils and regions are responsible for supplying their citizens with health care services. This includes hospital care, primary care and psychiatric care. A county council tax supplemented by a state grant is the main mean of financing the health care system. In addition to that small user fees are paid at the point of use. Long term care for the elderly is financed and organized by the municipalities. Each county council and region is governed by a political assembly, with its representatives elected for a four year period at every general election.

The county councils and regions are of different size. Stockholm, Västra Götaland and Skåne are considerably larger than the rest, with a population between one and two million each. Gotland is smallest, with about 60 000 inhabitants. Most of the other county councils have populations in the range 200–300 000 inhabitants.

Within the framework of national legislation and varying health care policy initiatives from the national government, the county councils and regions have substantial decision-making powers and obligations towards their citizens. The Swedish health care system is, in short, a decentralized system. This makes it natural to put focus on the performance of the county councils and regions.

75 indicators in a straightforward model of presentation

In this report, 75 quality and performance indicators are used to compare the county councils and regions. They are grouped and presented as follows:

- A Medical Results 48 indicators
- B Patient Experiences 10 indicators
- C Availability of care 4 indicators
- D Costs 13 indicators

The four areas are further presented in the beginning of each section. All indicators are listed in the content section in the beginning of the report. The model of presentation is straightforward. The results for all 21 counties and regions are presented in 75 figures, one per indicator. In some cases, notably in section A Medical Results, data for men and women are presented separately.

For almost all indicators the county councils and regions are ranked, from better outcomes to less good ones, corresponding to the top and the bottom of the figures, respectively. Exceptions to this model of presentation are the two indicators concerning psychiatric care, due to either/or lack of data or more fundamental problems with the interpretation of results. In section D Costs, it should be noted that low health care costs per capita not per se is a desired result; instead costs and outcomes should be valued together. For some indicators, the results are presented at hospital level, to illustrate the greater variation of outcomes between hospitals, compared to county council level.

The reader should observe that a good/bad relative outcome, in comparison to other county councils, not without qualifications is a good/bad absolute outcome. All county councils could have top results, for example in an international comparison – or vice versa. Variation of outcomes should be interpreted in the light of this observation.

Each indicator and figure is supplemented by a text, describing the data and commenting on the result as a whole as well as on the variation between county councils and regions. When possible, references to national clinical guidelines or other goals are made. In A Medical Results, and also in B Patient Experience 95% – confidence intervals is used to illustrate statistical uncertainty, for most indicators.

The set of indicators is chosen to mirror the health care system as a whole as good as possible, given the obvious and grave restriction of varying data availability. Still, the main evaluative effort is the ranking per each indicator. For a number of reasons we have had no ambition to summarize all indicators and results into an overall ranking of quality and efficiency.

Further material and contact persons

This report and all figures in the report can be downloaded in pdf-format.

Download from www.skl.se/publikationer

or from www.socialstyrelsen.se/publicerat

For information about this report and ongoing work in the joint project *Quality and Efficiency in Swedish Health Care – Regional Comparisons*, please contact

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A

Medical Results

A Medical Results

More than half of all the indicators are in the medical results group. That is a conscious choice. Waiting times, patient experience and costs are integral to the quality and efficiency of health care. But the most vital factor for assessing the performance of a healthcare system is its impact on the health of patients and the population as a whole.

To allow for an overview, the 48 indicators have been broken down into the following areas:

- Mortality, hospitalisation and vaccination
- Drug consumption
- Cancer survival rate
- Maternal and neonatal care
- Diabetes care
- Stroke care
- Cardiac care
- Orthopaedic care
- Other treatments

MORTALITY, HOSPITALISATION AND VACCINATION

Avoidable mortality

Since the mid-1980s, the EU has conducted a project to compare the healthcare systems of the various Member States by means of an avoidable mortality measure. The purpose of creating such a measure is to apply existing knowledge about the causes of certain diseases and the efficacy of various treatment methods. For a more detailed description of the avoidable mortality indicators, see Appendix 1.

The avoidable mortality indicators are based on a number of selected diagnoses and causes of death. The first indicator covers diagnoses and causes of death that are deemed to be primarily treatable by means of various medical interventions following early detection. We refer to this indicator as healthcare-related avoidable mortality. Among the diagnoses and causes of death included in this indicator are appendicitis, stroke, gallstone disease and cervical cancer.

The second set of diagnoses and causes of death are those deemed treatable by means of more broadly based policy efforts, such as smoking cessation campaigns and healthier alcohol habits. This indicator is referred to as policy-related avoidable mortality. Among the diagnoses and causes of death included in this indicator are lung cancer, cirrhosis of the liver and motor vehicle accidents.

In response to medical progress, the list has been modified further. Diabetes has been added to the healthcare-related indicator and oesophageal cancer to the health policy-related indicator. Moreover, the analysis has been limited to the 1–74 age group.

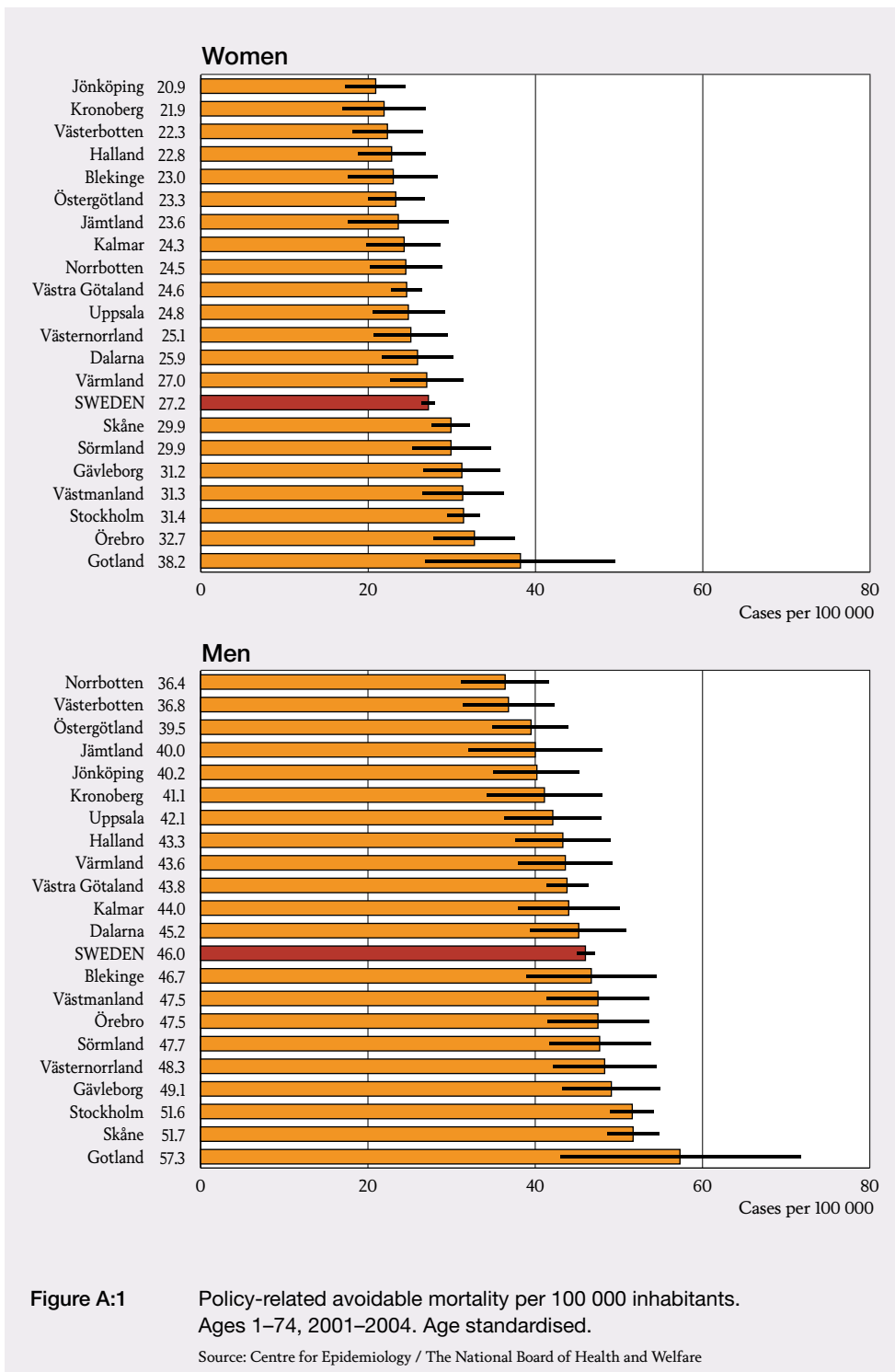
Policy-related avoidable mortality per 100 000 inhabitants (A:1)

Figure A:1 shows per health care region 2001–2004 data concerning policy-related avoidable mortality among women per 100 000 inhabitants. The comparison is age-standardised, i.e., a correction has been made for regional differences in the age structure of the population. Lung cancer and motor vehicle accidents accounted for the greatest percentage of deaths measured by this indicator.

The regions varied significantly from around 20 women per 100 000 inhabitants in one group to just over 30 women per 100 000 inhabitants in another. Jönköping, Kronoberg and Västerbotten had the lowest mortality rates. One reason is that women in Jönköping had the lowest mortality rate from lung cancer in Sweden and Västerbotten had the smallest percentage of daily smokers. Apart from Gotland, which exhibited major random variations due to its limited size, Örebro had the highest mortality rate for women. The high cirrhosis of the liver and lung cancer mortality rates in Örebro were the main contributing factors.

Men, as shown by the same figure, had the highest mortality rates in Skåne and Stockholm. Reflecting the large percentage of daily smokers, both regions had high lung cancer mortality rates. The cirrhosis of the liver mortality rate was also high in Stockholm. Mortality rates for men were lowest in Västerbotten and Norrbotten. Västerbotten had the lowest cirrhosis of the liver mortality rate in Sweden. Lung cancer mortality in Västerbotten was also below the national rate. Norrbotten had the lowest lung cancer mortality rate of all the regions.

The policy-related avoidable mortality rate was approximately 40 percent less for women (27.2 per 100 000 inhabitants) than men (46.0 per 100 000 inhabitants). Despite variations, the mortality rates were higher for men in all regions. The difference between women and men was greatest in Blekinge and Västernorrland, whereas it was smallest in Västerbotten, Norrbotten and Örebro.



Healthcare-related avoidable mortality per 100 000 inhabitants (A:2)

Stroke, diabetes and cervical cancer are major contributors to the healthcare-related avoidable mortality indicator. Figure A:2 shows that Halland had the lowest mortality rate for women and among the lowest for men. Diabetes mortality rates were lowest in Halland and Kronoberg for men, and in Halland and Västerbotten for women. Variations among the regions were of approximately the same magnitude as for policy-related avoidable mortality.

Gävleborg was the highest for women. The reason is that stroke and cervical cancer mortality rates were higher than in any other region. Diabetes mortality rates were highest in the populations of Gotland and Sörmland.

Gotland and Värmland had the highest mortality rates for men. The stroke mortality rate was highest in Värmland. Diabetes mortality rates were high in those two regions as well. Gotland also had the highest mortality rate in Sweden when it came to hypertension and related diseases.

Generally speaking, mortality rates were significantly higher for men than women, but the differences were smaller than in the case of policy-related avoidable mortality. The gender differences varied from region to region. The greatest differences were in Värmland, Gotland and Jönköping. The smallest differences were in Kronoberg (0.8 per 100 000 inhabitants), Västmanland and Uppsala.

Partly because traditions of diagnostic coding may vary among the regions, the differences in healthcare-related avoidable mortality (particularly from diabetes) should be interpreted with a degree of caution.

No international comparisons have proceeded from a measure of healthcare-related avoidable mortality identical to the one used here. A similar comparison for 1998 among 19 countries found that Sweden had the lowest mortality rates.

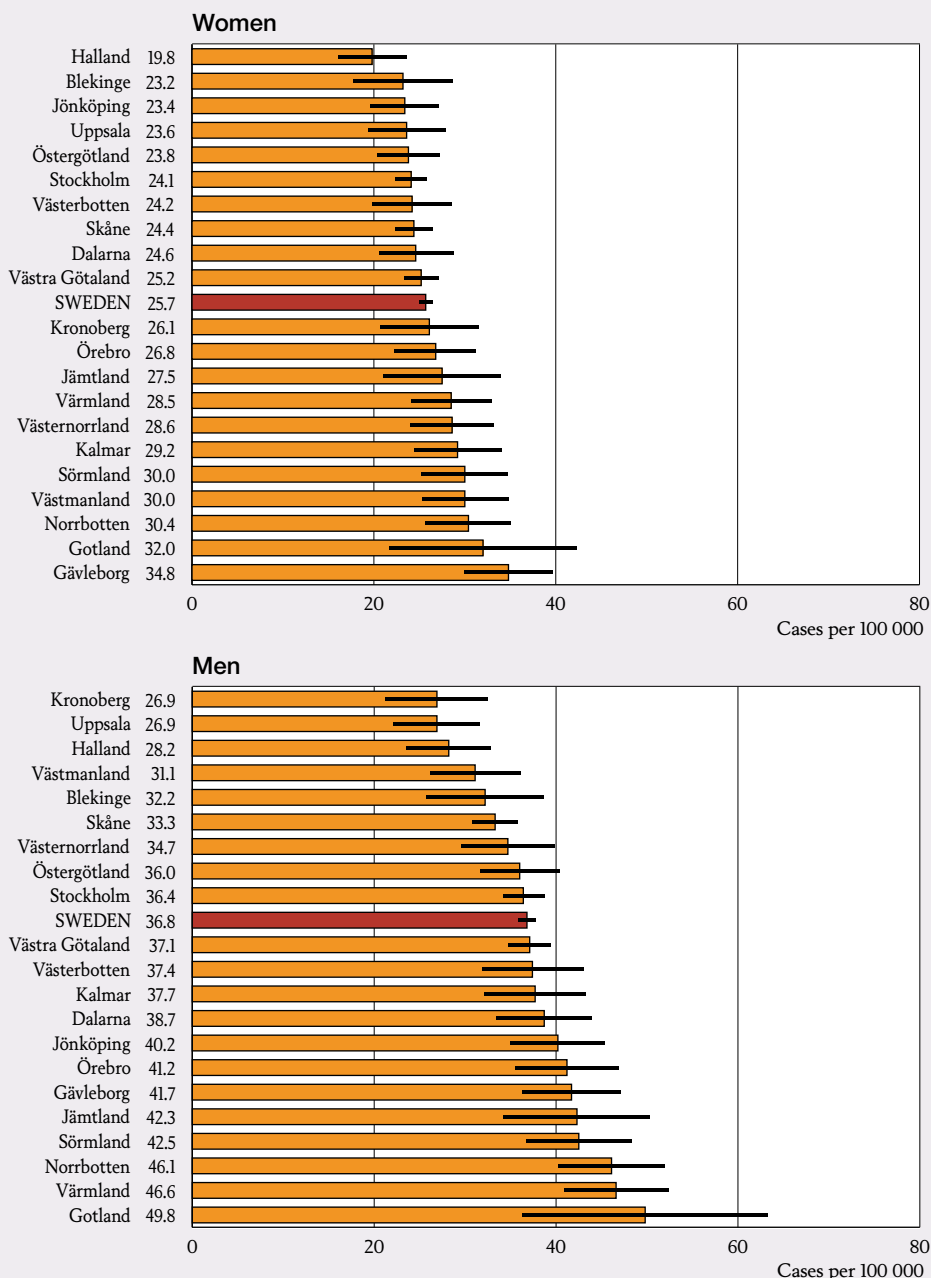


Figure A:2 Healthcare-related avoidable mortality per 100 000 inhabitants. Ages 1–74, 2001–2004. Age standardised.

Source: Centre for Epidemiology / The National Board of Health and Welfare

Avoidable hospitalisations per 100 000 inhabitants (A:3)

The avoidable hospitalisations indicator measures efficiency, availability and treatment for selected conditions in outpatient care, such as preventive public health and primary care. The assumption is that unnecessary hospitalisations can be avoided if patients with the selected conditions receive proper outpatient care.

The avoidable hospitalisations indicator includes a number of selected diagnoses. First are diagnoses that reflect outpatient treatment of chronic or long-term conditions. The selected conditions are anaemia, asthma, diabetes, heart failure, hypertension, chronic obstructive pulmonary disease and angina pectoris.

Second are several acute conditions for which proper treatment within a reasonable period of time should avert hospitalisation. The selected conditions are bleeding ulcers, diarrhoea, epileptic seizures, inflammatory diseases of female pelvic organs, pyelitis and ear, nose and throat infection.

Other countries use similar aggregate measures – the English literature often refers to ambulatory care sensitive conditions. The availability and quality of outpatient care has been shown to explain some of the regional differences when it comes to hospitalisation for these selected conditions.

Figure A:3 shows the annual number of people per 100 000 inhabitants with avoidable hospitalisations in 2004–2006. The data are age-standardised. The fact that men exhibit higher rates is probably due to the selection of diagnoses rather than their having received poorer outpatient treatment. The regional differences were relatively large but not extreme.

Translated to care events, care days and thereby bed requirements, the differences in resource utilisation are relevant to daily healthcare management. A breakdown of the comparison to local authorities and groups of local authorities would show a significantly greater variation.

But because the occurrence of certain conditions, and possibly the diagnostic codings used, varies from region to region, differences in avoidable hospitalisation should be interpreted with a degree of caution. The availability of hospital beds probably plays a role as well. If there are plenty of beds, the threshold for hospital admission is lower, and vice versa.

While potentially avoidable hospitalisations will never be totally eliminated, the regional differences indicate that latitude exists for better outpatient care.

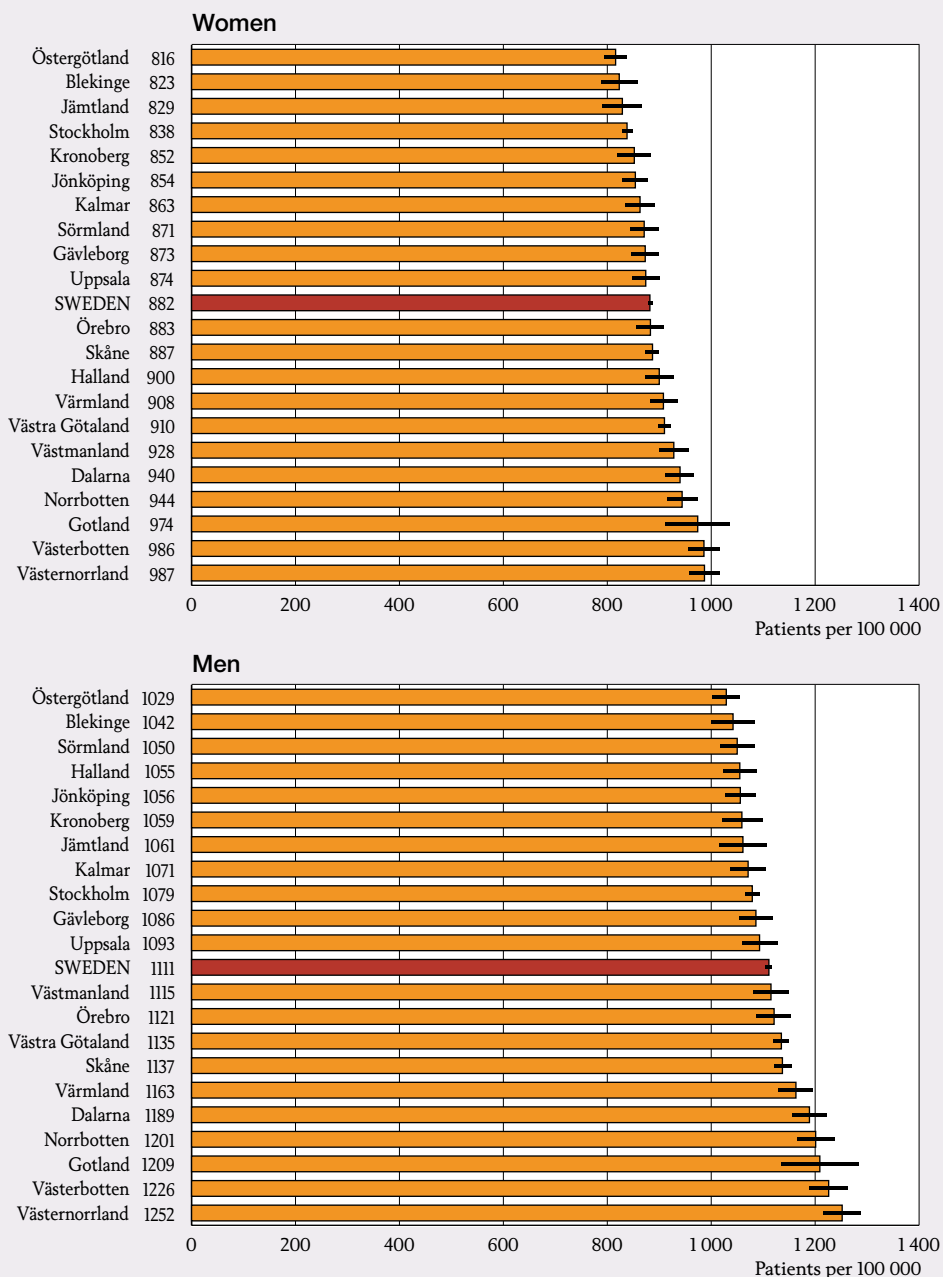


Figure A:3

Patients per 100 000 inhabitants with avoidable hospitalisations, 2004–2006. Age standardised.

Source: Centre for Epidemiology / The National Board of Health and Welfare

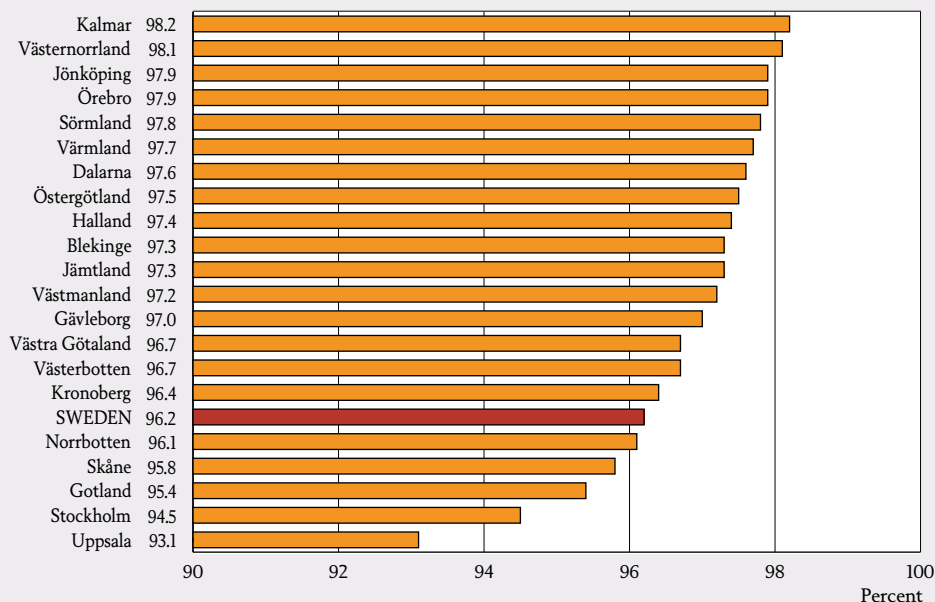


Figure A:4 Vaccination of children – measles, mumps, rubella. Children born 2004, vaccination status reported in January 2007. Percent.

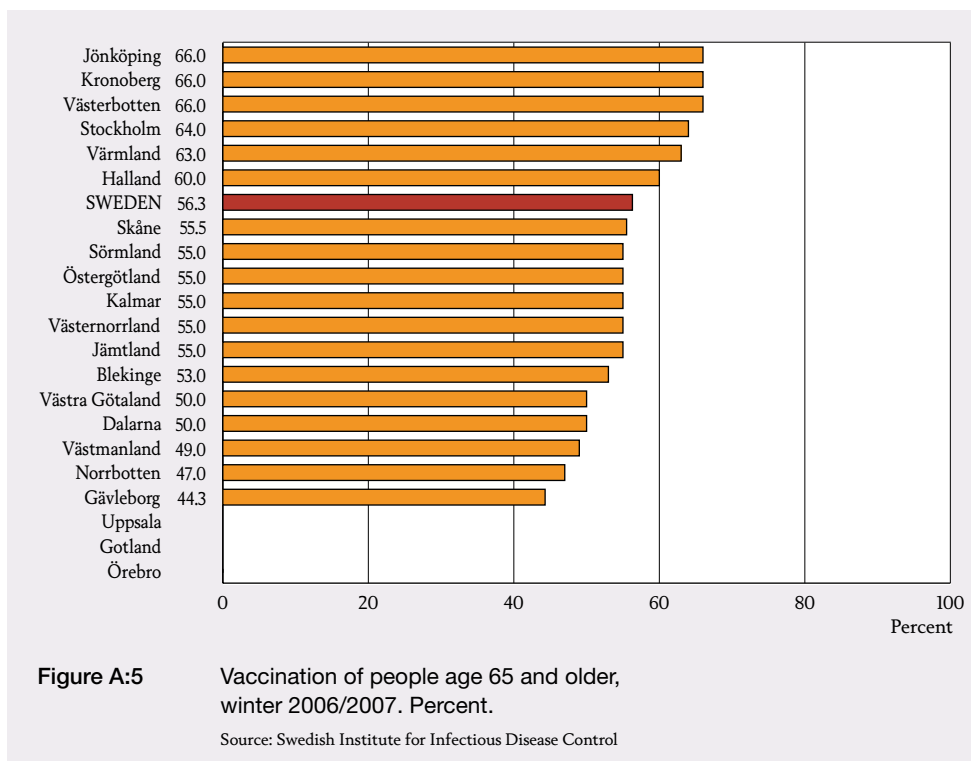
Source: Swedish Institute for Infectious Disease Control

Vaccination of children – measles, mumps, rubella (MMR) (A:4)

After the combined MMR vaccine was introduced in 1982, reported cases of the three viral infections declined within a few years and are now uncommon in Sweden. To prevent the diseases from gaining a foothold, 90–95 percent of the population must be immune, either through vaccination or natural infection.

In Sweden, the vaccine is given at 18 months and age 6–7 (previously age 12). Vaccination data are kept by the child health care system and collected by the Swedish Institute for Infectious Disease Control. Figure A:4 shows the percentage of children born in 2004 who had been given the MMR vaccine as of January 2007.

A large percentage of Swedish children are vaccinated compared to other countries. The proportion rose from 94.5 percent in 2005 to 96.2 percent in January 2007. The great majority of regions had 96–97 percent in the 2007 measurement. Kalmar had the highest result in both 2005 (97 percent) and 2007 (98 percent). The modest increase was common to all regions besides Gotland and Uppsala, which were unchanged from 2005 to 2007. Jämtland increased the most, from 93.6 to 97.3 percent.



Vaccination of people age 65 and older – influenza (A:5)

Various groups – such as people age 65 and older, as well as those with chronic heart or lung disease or impaired immune system – are at higher risk of complications from influenza. To avoid premature death and influenza-related care, flu vaccine must always be available to these groups

Figure A:5 shows the percentage of Swedes age 65 and older who were vaccinated against flu during the winter of 2006–2007. The statistics are based on annual compilations by the various regional infectious disease control units. Owing to a lack of data, the national figures do not include Uppsala, Gotland or Örebro.

Because there is currently no uniform or regulated national method for reporting the number of vaccinations, the comparison is associated with a great deal of uncertainty. But the Institute for Infectious Disease Control is in the process of implementing procedures through the Svevac (vaccination) register to ensure greater uniformity. Three pilot regions are reporting to Svevac in 2007, and the other regions will join them in 2008 assuming that all goes according to plan.

The number of people age 65 and older who received flu vaccine showed relatively large regional variations – from 44 to 66 percent. Kronoberg and Västerbotten were among the regions with the highest percentages in 2006–2007, having increased by 13 and 18 percentage points respectively since 2004. Östergötland also improved substantially from 35 to 55 percent during that period. But Norrbotten decreased by 8 percentage points. As mentioned above, a word of caution is in order when interpreting the results.

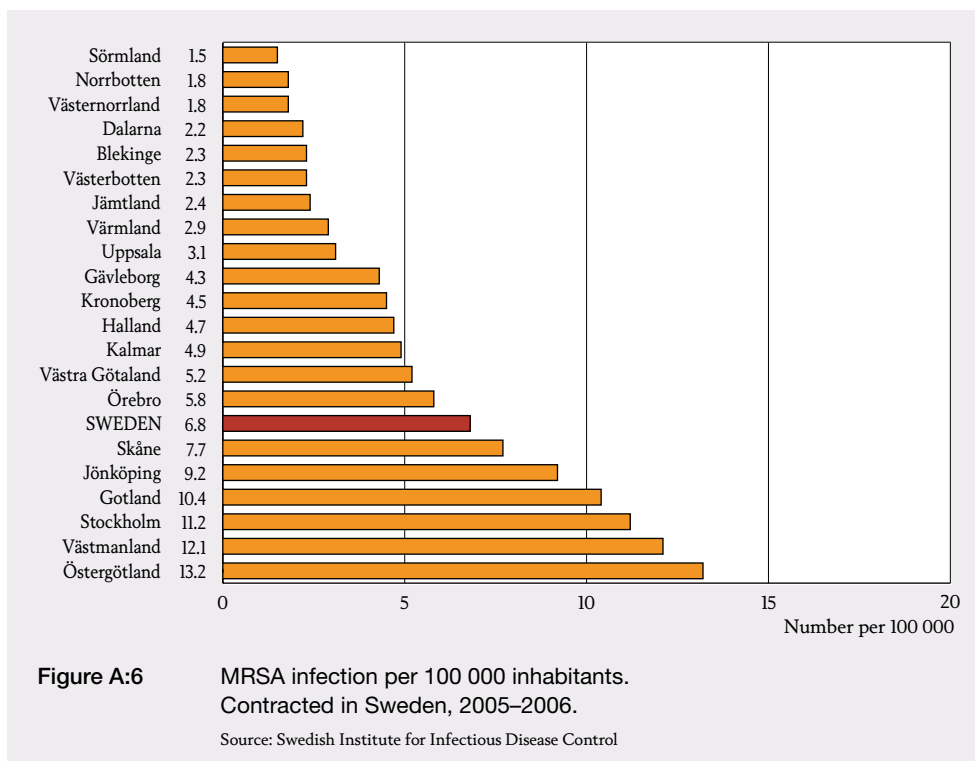
MRSA infection per 100 000 inhabitants (A:6)

Staphylococcus aureus is among the most common bacteria in the skin and nasal passages, as well as the most frequent source of skin abscesses. While the bacteria does not usually have any ill effects, it can cause serious conditions such as meningitis and pneumonia, as well as musculoskeletal and joint infections. Approximately 1 percent of all *Staphylococcus aureus* detected in Swedish laboratory cultures are methicillin-resistant *Staphylococcus aureus* (MRSA). Methicillin is the antibiotic normally prescribed for *Staphylococcus* infections.

MRSA and other *Staphylococcus* bacteria are sometimes referred to as hospital bugs. The bacteria thrives and reproduces in wounds, eczema and catheters that are common in hospitals and other inpatient facilities. The infection is spread by direct contact between patients and staff or other patients. Once MRSA has gained a firm foothold at a hospital, there is a large risk that it will spread. The bacteria may be very difficult to get rid of and calls for strict hygiene procedures on the part of the facility. In 2006, the source of most MRSA cases that had been contracted in Sweden was outside of care facilities. So the term hospital bug is somewhat misleading.

In addition to the suffering that MRSA infection can cause, ensuring a low number of cases is desirable for a number of reasons. Given the infection's resistance to antibiotics, treatment options are limited, more expensive and associated with additional side-effects. It can spread quickly at a healthcare facility and demands major resources in terms of isolating infected patients and other measures.

A total of 1 057 MRSA cases were reported in 2006, as opposed to 975 in 2005. Women and men were equally affected, and all age groups were represented. Since MRSA infection became subject to reporting in 2000, the number of cases has increased year by year. While partly reflecting actual occurrence in the population, the higher figures may also be due to more frequent testing. A total of 58 percent of the 1 057 cases in 2006 were reported to have been contracted in Sweden.



Along with Norway, Denmark and the Netherlands, Sweden is among the countries with a very low occurrence of MRSA infection.

The comparison among various regions in Figure A:6 shows that the number of cases contracted in Sweden varied between 1.5 and 13.2 per 100 000 inhabitants. The smallest percentages were in Sörmland, Norrbotten and Västernorrland. The figure presents the average number of cases in 2005–2006. Östergötland – which had the most cases – experienced a very high occurrence in 2005, falling sharply in 2006 once hospital bugs had been brought under control. The occurrence in Gotland was also high during 2005 and dropped substantially in 2006. Västmanland and Stockholm had high occurrences as well, primarily in 2006.

DRUG CONSUMPTION

The 2006 report presented two indicators, Psychopharmacological Drugs and Drug-drug Interactions concerning drug consumption by the elderly. This report retains both indicators. This report also includes an additional indicator concerning drug consumption by the elderly, as well as an indicator concerning fluoroquinolone therapy for urinary tract infection in women.

The quality indicators concerning drug consumption by the elderly that the NBHW has developed are now well-known and used in many places throughout Sweden, particularly in connection with the national effort of the various pharmaceutical committees concerning drug consumption by the elderly. Besides various applications in clinical practice, including prescription support and drug reviews, the indicators have been used in a number of epidemiological studies and assessments, as well as register studies.

The source of these data is the Prescribed Drug Register. The register contains all individual data concerning prescriptions that have been picked up under the pharmaceutical benefits scheme, i.e., as part of outpatient care. Drug consumption as part of inpatient care is not included.

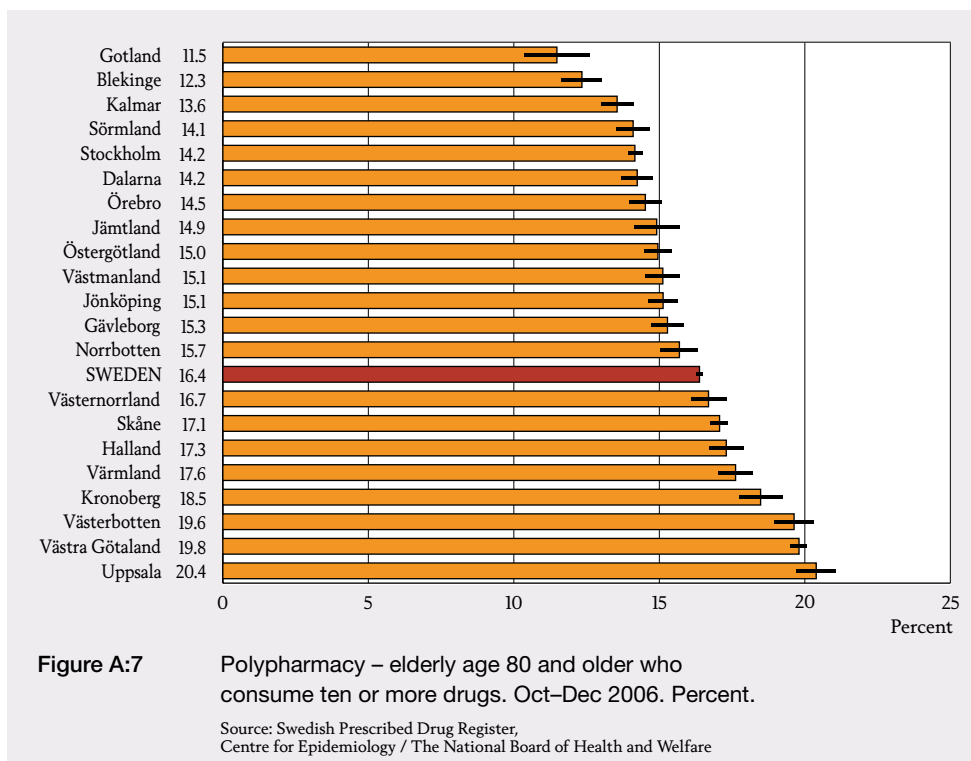
This report presents three key indicators used in an analysis of drug consumption by all Swedes age 80 and older as entered in the Prescribed Drug Register from October to December 2006. The analysis included 466 000 people.

Polypharmacy – elderly who consume ten or more drugs (A:7)

Studies have demonstrated that polypharmacy (concurrent consumption of several drugs) is associated with non-compliance, higher costs, the risk of harmful drug-drug interactions and drug-related hospitalisation.

The scientific literature sometimes defines polypharmacy as the concurrent consumption of five or more drugs. Some studies of the elderly employ the consumption of ten or more drugs as a measure of excessive polypharmacy.

Figure A:7 shows the percentage of elderly who consumed ten or more drugs. A total of 16 percent, with a regional variation of 11–20 percent, of all Swedes age 80 and older consumed 10 or more drugs concurrently. The lowest percentages were in Gotland, Blekinge and Kalmar, while the highest were in Uppsala, Västra Götaland and Västerbotten.



This report presents a number of other indicators concerning drug therapy for diabetes, stroke and myocardial infarction. For those indicators, a high percentage of patients receiving drug therapy is regarded as desirable. Guidelines for various indicators and groups of diseases in order to support drug therapy can collectively have undesired effects (polypharmacy). In that sense, polypharmacy conflicts with the other indicators. That illustrates the importance of choosing therapies that proceed from an overall assessment of the individual patient's needs.

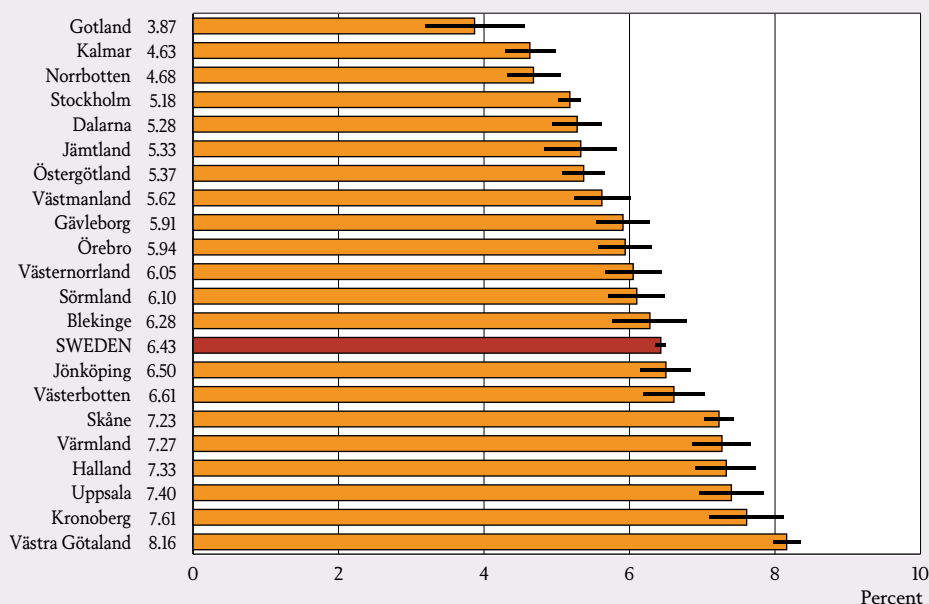


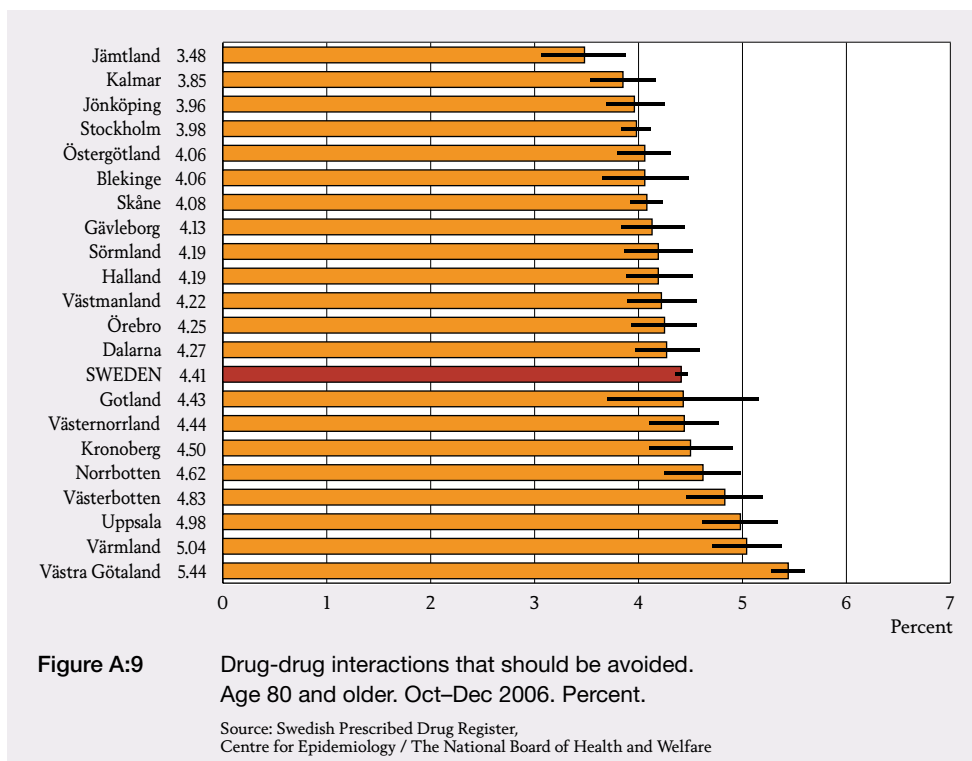
Figure A:8 Polypharmacy – Elderly age 80 and older who consume three or more psychopharmacological drugs. Oct–Dec 2006. Percent.

Source: Swedish Prescribed Drug Register,
Centre for Epidemiology / The National Board of Health and Welfare

Polypharmacy – Elderly who consume three or more psychopharmacological drugs (A:8)

Concurrent therapy with three or more psychopharmacological drugs (such as a neuroleptic, a tranquilizer and an antidepressant), whether routinely or on demand, is a generally accepted indicator of polypharmacy. Concurrent consumption of several pharmacological drugs not only increases the risk of side-effects and drug-drug interactions (see below), but may point to inadequate treatment of psychiatric conditions.

Figure A:8 shows significant regional variations for this indicator, ranging from less than 4 percent in Gotland to more than 8 percent in Västra Götaland. The variation is greater than that for the number of drugs consumed per person (not included in the figure). The number of drugs per person varies from 5.3 to 6.3 among the different regions, generating a national average of 5.8. Those results suggest that the regional variation in this indicator partly reflects prescription patterns of psychopharmacological drugs for the elderly rather than of drugs in general.



Drug-drug interactions that should be avoided (A:9)

Class C and D are the clinically relevant drug-drug interactions, i.e., combinations of drugs that can have a significant impact on how each of them is metabolised or acts. According to FASS (the Swedish equivalent of the Physicians' Desk Reference), a Class D interaction "can lead to serious clinical consequences in terms of severe side-effects or lack of efficacy, or may otherwise be difficult to control with individual doses. Thus, the combination should be avoided."

For Sweden as a whole, the occurrence of Class D interactions was greater (4.4 per cent) than in the NBHW's 1998 survey of drug consumption by the elderly (3.0 percent). Jämtland, Kalmar and Jönköping had the lowest percentages, while Västra Götaland, Värmland and Uppsala had the highest.

The regional variations were modest. But they point to differences in regional prescription patterns and thereby the quality of drug consumption by the elderly.

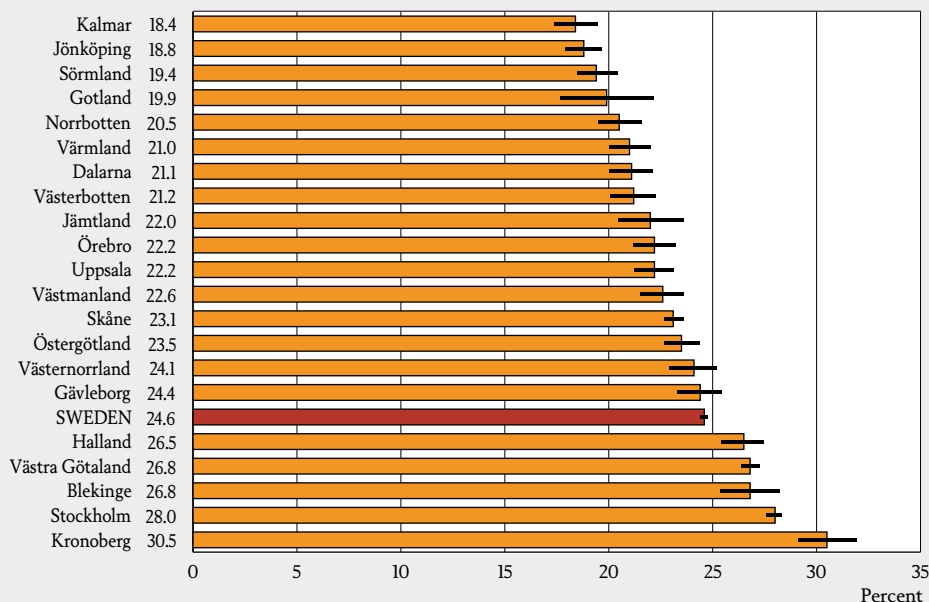


Figure A:10 Proportion women treated with fluoroquinolone therapy for urinary tract infection. Age 18–64, 2006. Percent. Age standardised.

Source: Swedish Prescribed Drug Register,
Centre for Epidemiology / The National Board of Health and Welfare

Fluoroquinolone therapy for urinary tract infection in women (A:10)

Scandinavia in general and Sweden in particular tend to prescribe antibiotics less often than the rest of Europe. Moreover, the Scandinavian countries use a greater percentage of narrow-spectrum antibiotics, whereas Eastern and Southern Europe use a high percentage of broad-spectrum antibiotics. The lowest possible prescription of broad-spectrum antibiotics is desirable.

Quinolones are a family of broad-spectrum antibiotics that should generally be reserved for serious infections. The target of the Swedish Strategic Programme Against Antibiotic Resistance (Strama) and the Swedish Association of General Practice (SFAM) is that quinolones constitute no more than 10 percent of all prescriptions for urinary tract infection.

Quinolones as a percentage of all antibiotics prescribed for urinary tract infection were studied for all women age 18–64 who picked up a prescription for one of a selection of antibiotics in 2006. More than 230 000 women were included. It is not possible to analyze the consumption of drugs according to the indication for which they were prescribed. Thus, some of the prescriptions may have had other indications than lower urinary tract infection. But such prescriptions should represent a small percentage of the total and are not likely to differ much among the various regions.

Figure A:10 shows that all regions were far above the levels recommended by Strama and SFAM. That observation is more important than the fact of significant variations among the different regions. The high percentage in Kronoberg may have had special, temporary causes. The analysis has not taken into consideration any regional differences in the occurrence of resistance.

CANCER SURVIVAL RATE

Cancer is the most common cause of death in Swedes under age 75. A total of 50 000 cancer cases were diagnosed in 2005. There are a large number of people with cancer due to the fact that there are so many survivors or those who live with it longer. There were 150 000 Swedes at the end of 2005 who had been diagnosed with cancer since 2001. That prevalence is expected to increase in the future. Cancer care, particularly treatment methods and ensuring equal access to them, is frequently discussed. The government is putting together a plan to improve cancer care, and the NBHW introduced national guidelines in spring 2007 for certain types of cancer.

We present five indicators of care for the four common kinds of cancer: breast, colon, rectal and prostate. Three indicators concern five-year survival rates, one concerns rates of active treatment and one (new) concerns reoperations after surgery. The data for five-year survival rates are taken from the Swedish Cancer Registry, while the other data are taken from national healthcare quality registers.

Cancer survival rates

Relative five-year survival rates have been calculated for patients diagnosed with cancer in 1999–2005 and followed up until December 2005. Relative means that the rates represent a comparison with expected survival of people who have not been diagnosed with cancer. A relative five-year survival rate of 50 percent indicates that half of the cancer patients would have been alive after five years if cancer had been the only possible cause of death. Any regional differences in average life expectancy have been taken into consideration.

Survival time refers to the period between diagnosis and death. The survival time can be extended by both early detection and proper care. Thus, early detection leads to a longer survival time regardless of whether or not actual length of life increases. If early detection is at a stage in which the malignancy is easier to treat, thereby postponing death, both of the above factors come into play.

The most recent comparison study of cancer survival rates in Europe was conducted as part of the 19-country EUROCARE-4 collaboration project. But because EUROCARE-4 used a different analytical method than the Swedish Centre for Epidemiology (EpC) when calculating five-year survival rates, the data are not directly comparable with those presented here.

Sweden outperformed the average of the European countries that were studied when it came to the three types of cancer for which five-year survival rates are presented here. Swedish survival rates were almost 4 percentage points above the European average for colon and rectal (grouped as colorectal) cancer and approximately 7 percentage points above the European average for breast cancer.

Breast cancer – relative five-year survival rates (A:11)

Breast cancer is the single most common type of cancer among Swedish women, representing 29 percent of all diagnoses in 2005. Almost 7 000 women are diagnosed with breast cancer each year. In other words, one in ten women will have breast cancer at some point in her life. The incidence has been increasing, though slowly, for the past few decades. Male breast cancer occurs but is rare.

Breast cancer is uncommon before 40, after which it increases with age. One out of every two breast cancer patients develops the disease before the age of 65. Almost 80 000 Swedish women who have been treated for breast cancer are currently alive. Approximately 1 500 women die of the disease each year.

The five-year survival rate has risen from 65 percent in the mid-1960s to 84 percent of women diagnosed in the mid-1990s. The improvement is due to early detection by means of mammography screening, as well as better treatment methods.

While all regions now provide mammography screening, they differ in terms of when the service began and the age range of women who are called to receive the examination. The extent to which women in the at-risk age groups receive mammographies is not currently being monitored at the national level. Such an effort should be launched.

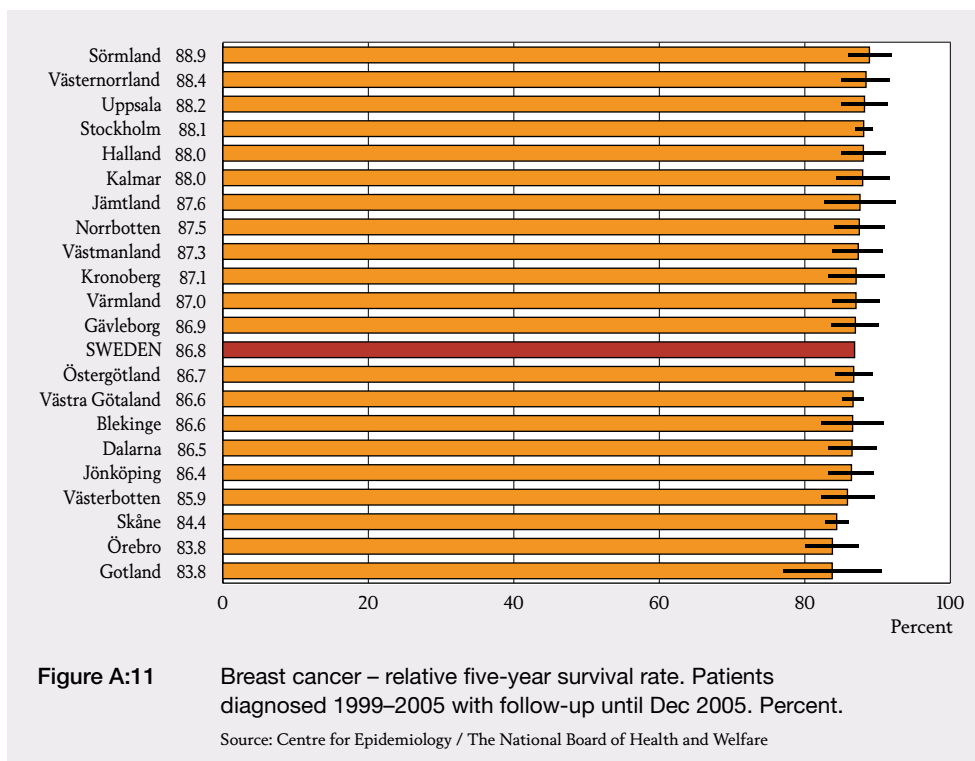


Figure A:11 shows that the five-year relative survival rate was almost 87 percent for the country as a whole. Sörmland had the highest rate whereas Örebro and Gotland had the lowest – but note that the statistical uncertainty for Gotland was relatively great.

The regional variations were small. Relative survival rates varied from 84 to 89 percent, i.e., approximately ± 3 percentage points from the national average. Previous analyses showed greater regional differences, partly because regions with poorer survival rates had not yet started mammography screening.

Colon cancer – relative five-year survival rates (A:12)

Colon cancer is one of the most common types of cancer. In 2005, colon cancer accounted for 6 percent of all cancer diagnoses in men and 8 percent in women. Approximately 4 000 Swedes, most of them age 70-75, develop colon cancer each year. Colon cancer is uncommon in people younger than 30. Total prevalence, the number of people currently living who were diagnosed with colon cancer in 1958–2005, was 25 000 at the end of 2005. More than 1 700 Swedes died of colon cancer in 2004.

The relative five-year survival rate for Sweden as a whole was 56 percent among men and 60 percent among women. Men had the highest rate in Dalarna and the lowest in Sörmland. Women had the highest rate in Jönköping. Västerbotten and Gotland had low relative survival rates for both women and men. But because both regions had comparatively few cases of cancer, their results were associated with greater uncertainty. That uncertainty was reflected in their wide confidence intervals.

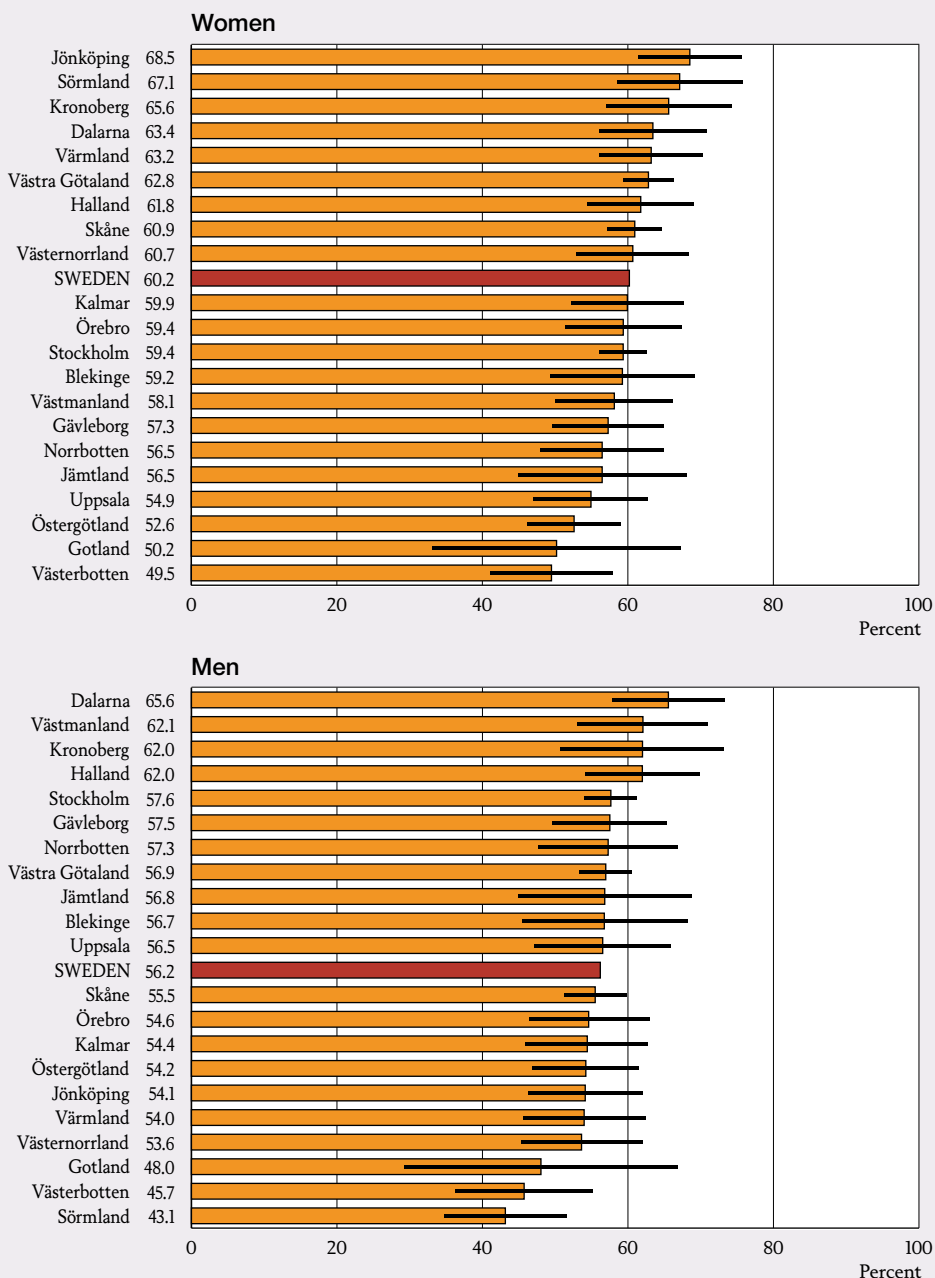


Figure A:12

Colon cancer – relative five-year survival rate. Patients diagnosed 1999–2005 with follow-up until Dec 2005. Percent.

Source: Centre for Epidemiology / The National Board of Health and Welfare

Rectal cancer – relative five-year survival rates (A:13)

Colorectal cancer is among the most common types of cancer. Rectal cancer accounted for 4 percent of all cancer diagnoses in 2005 for both women and men. Some 1 600 Swedes, or approximately 1 in 5 000, develop the disease every year. Given that symptoms often manifest early and people go to the doctor, many of them have a high chance of being cured. Rectal cancer usually develops at age 70–75. Almost 700 people died of the disease in 2004.

The relative five-year survival rate for Sweden as a whole was 56 percent among men and 61 percent among women. Men had the highest rate in Norrbotten and the lowest in Östergötland. Women had the highest rate in Blekinge and the lowest in Gotland.

But there were comparatively few cases. Thus the survival figures are highly uncertain, as reflected in the wide confidence intervals. For instance, Gävleborg had the second lowest relative five-year survival rate for men but was among the highest for women.

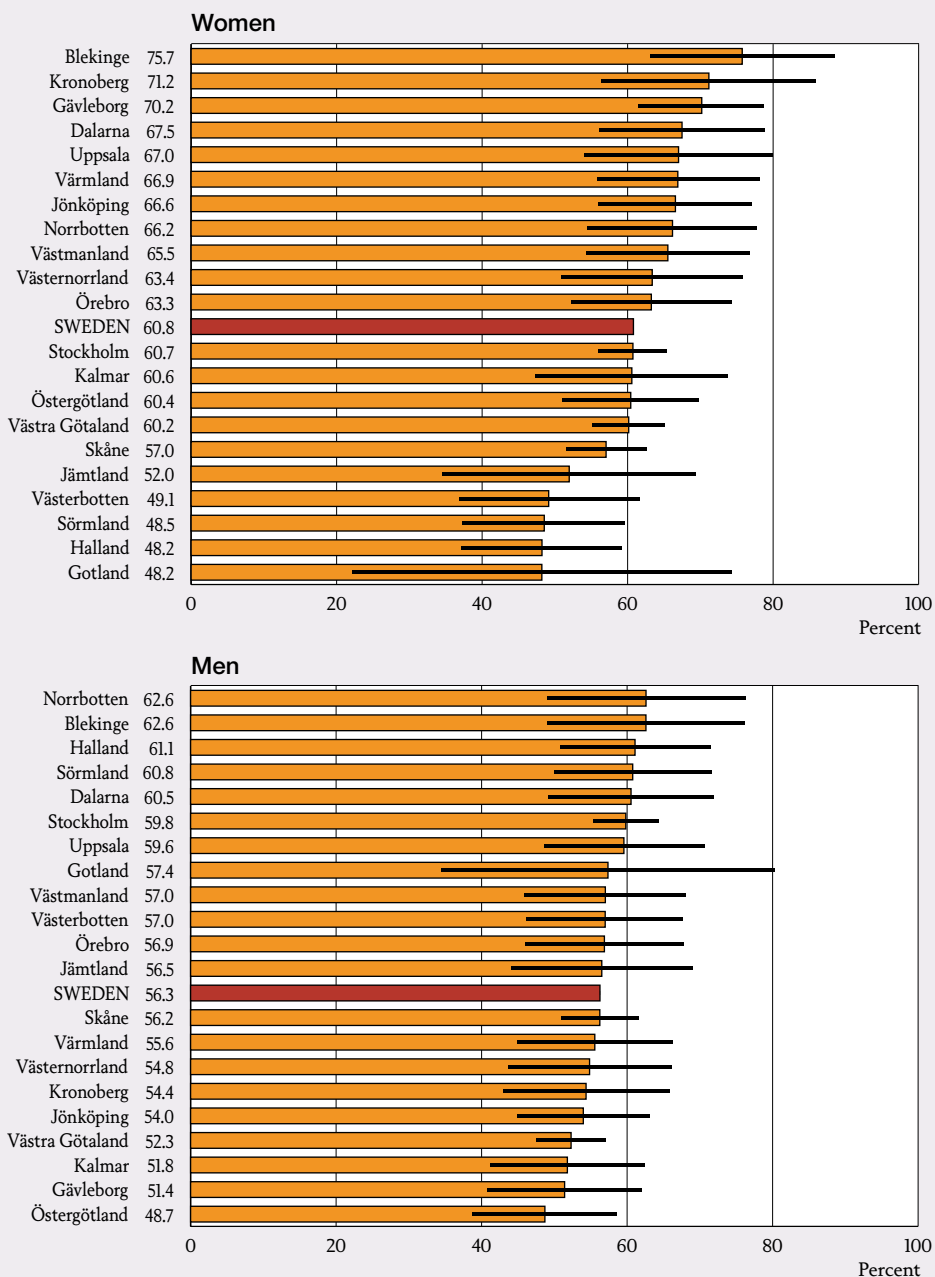


Figure A:13

Rectal cancer – relative five-year survival rate. Patients diagnosed 1999–2005 with follow-up until Dec 2005. Percent.

Source: Centre for Epidemiology / The National Board of Health and Welfare

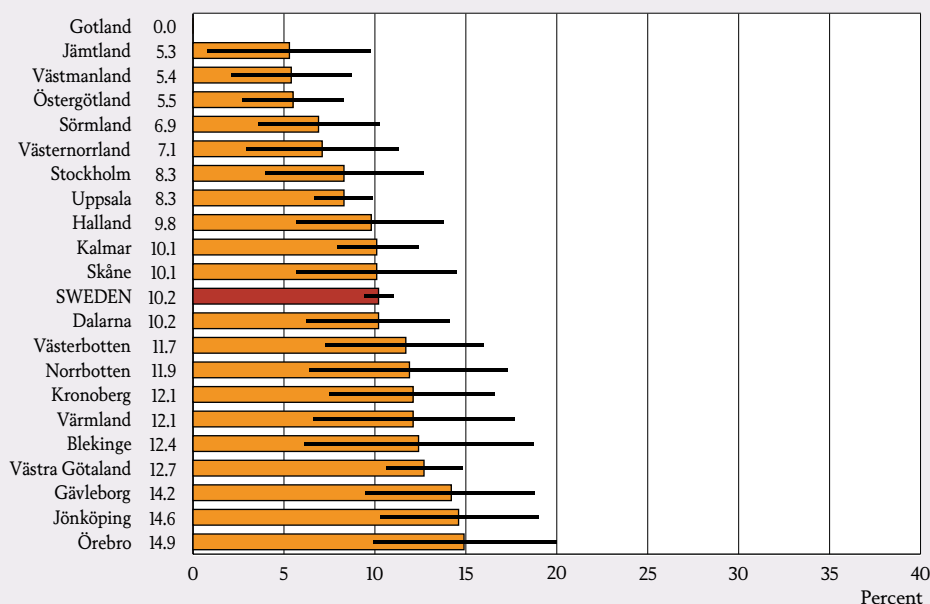


Figure A:14 Rectal cancer – reoperation within 30 days.
2001–2005. Percent.

Source: Swedish Rectal Cancer Registry

Rectal cancer – reoperation within 30 days (A:14)

The national guidelines contain a number of key quality indicators for treatment of rectal cancer. One of them is the percentage of reoperations within 30 days of initial surgery. The source is the Swedish Rectal Cancer Registry, which issues public reports of results on a hospital-by-hospital basis.

The great majority of rectal cancer patients undergo surgery. Depending on the nature of the individual tumour and the condition of the patient, surgery can vary in terms of scope and risk. Complications can arise that require reoperation fairly shortly after initial surgery. The frequency of reoperation may vary according to the procedures and reasons associated with initial surgery.

More than one third of patients have some kind of complication. Certain of these complications lead to reoperation. The reoperation frequency for Sweden as a whole has remained unchanged at approximately 10 percent for a number of years. Although the figure may appear to be high, it is not unusual compared with other countries.

Figure A:l4 shows the percentage of reoperations in 2001–2005. The data include just under 5 900 initial procedures, of which 600 were followed by reoperations. There were major regional differences at the extremes. Three regions had reoperation rates of less than 5 percent, while the three highest regions approached 15 percent.

The differences among the regions do not necessarily mean that care is better or poorer in some of them. For instance, it is possible that some hospitals report minor interventions as reoperations, whereas others do not. The data have not been validated in that respect. Refer to the explanatory box and figure in which the data for this indicator are also broken down by hospital.

Data broken down by hospital

The figure shows the same data as Figure A:14, but broken down by hospital. Only hospitals that performed surgery for rectal cancer in 2005 are included. Notice that the figure covers 1997–2005, as opposed to 2001–2005 in Figure A:14. The consequent inclusion of more procedures reduces the statistical uncertainty. Restricting the data to 2001–2005 would have significantly widened the confidence interval.

From that point of view, obtaining data from long periods of time and many procedures proves advantageous. But the use of longer periods of time may cause the results for the various hospitals to reflect outdated circumstances. When discussing and drawing conclusions about the quality of care in Hudiksvall and Värnamo, whether or not the reoperation rate was uniform over time must be taken into consideration. The same is true of the hospitals at the top of the figure.

The above considerations illustrate a tension between "assessment" and "improvement" in the presentation of healthcare data. In the pursuit of a fair comparison, should older data – when not all of the surgeons, nurses and procedures were the same as today – be used? Or, in order to support improvement efforts, should data that better reflect current clinical practice be relied on? In order to minimise the impact of such factors, only the past nine years of the register are presented. As a result, improvements or changes for the worse will show up that may be due to doctors having left the hospital and similar developments.

An important detail about the data in the Swedish Rectal Cancer Registry is that corrections are normally made for patient mix in terms of age and gender, as well as tumour stage and level. A:14 does not make any such corrections. But the register makes such corrections by means of odds ratios when presenting its results. While improving the quality of the comparison, correcting for patient mix does not resolve the tension between statistically reliable and current data.

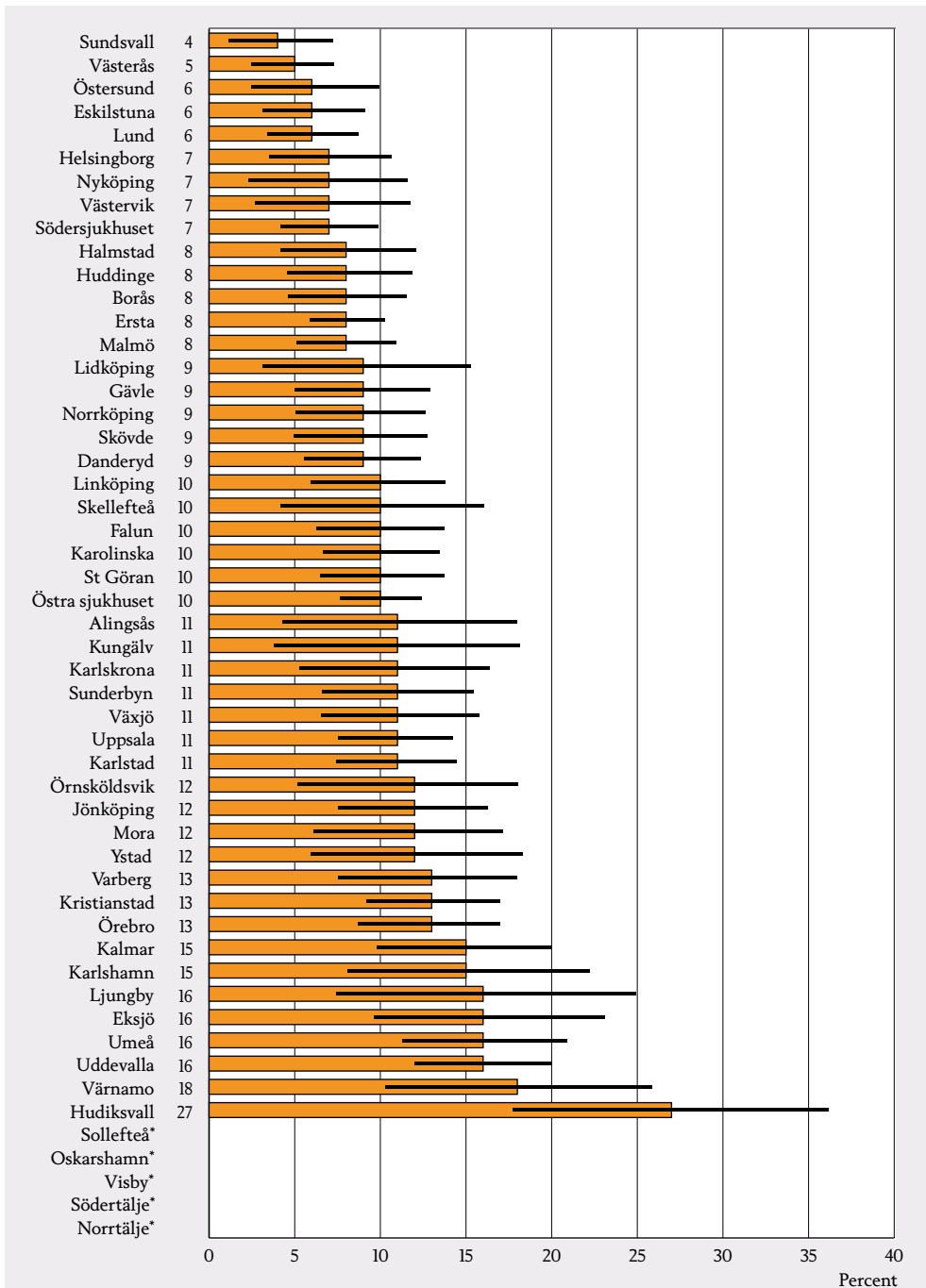


Figure A:14
Hospital

Rectal cancer – reoperation within 30 days.
2001–2005. Percent.

Source: Swedish Rectal Cancer Registry
* Not applicable

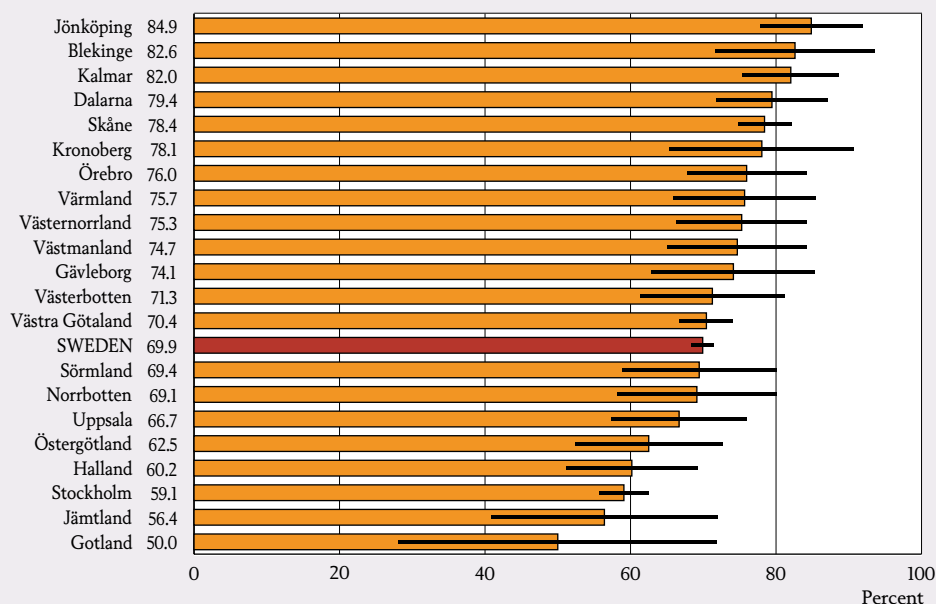


Figure A:15 Prostate cancer – active treatment of patients younger than age 65 with localised cancer. 2005. Percent.

Source: National Prostate Cancer Register

Prostate cancer – active treatment of patients younger than age 65 (A:15)

Prostate cancer, which is the most common type of cancer among Swedish men, was diagnosed in almost 9 500 patients in 2005. One in ten Swedish men develops the disease at some point during his life. Half were younger than 70 at the time of diagnosis, while almost 3 300 were younger than 65. Although the number of new cases has risen substantially in recent years, mortality rates have remained basically unchanged. The increase in the number of detected cancers was primarily due to more frequent diagnosis in men without symptoms. Age at the time of diagnosis has decreased accordingly. Despite its being a common disease, knowledge about optimal treatment at various stages is lacking.

Five-year survival rates are difficult to interpret when it comes to prostate cancer and are not used here. We present instead the percentage of patients under 65 with localised prostate cancer who have received active treatment, such as surgery or radiotherapy. The national cancer guidelines propose use of this indicator. The data are taken from the National Prostate Cancer Registry. The registry covers a high 97 percent of the cases in the National Cancer Registry.

It has been demonstrated that surgery in this group of patients reduces the mortality rate from prostate cancer as well as the total mortality rate. The risk that the malignancy will spread is also significantly lower following surgery. Although no comparison studies have been performed, surgery and radiotherapy are regarded as equally effective. Thus, a large percentage of patients younger than 65 should be offered active treatment.

Some patients choose not to receive treatment because of possible side-effects. There are also men with severe concurrent diseases for whom active treatment is not a feasible option. The number of patients who receive active treatment has increased significantly in recent years. But the trend was interrupted in 2005, the last year for which data are available. That development may be due to greater reliance on active monitoring, in cases where the risk is small that the disease will progress. If diagnosis (elevated PSA levels) points to progression, active treatment is started.

Figure A:15 shows the results for 2005 by region. The national result was over 70 percent, as opposed to 82 percent in 2004. Almost 2 300 Swedes received active treatment. The regional variation was significant – Jönköping and Blekinge were at the top with over 80 percent, while Stockholm, Jämtland and Gotland were below 60 percent. But statistical uncertainty may have played a role – for instance Gotland and Jämtland were the highest regions in 2004 at over 90 percent.

MATERNAL AND NEONATAL CARE

Five indicators are presented for maternal and neonatal care. Results for some of the indicators may be due to circumstances that are difficult for the healthcare system to affect, while the relationship to clinical practice and its regional variations is clearer for other indicators.

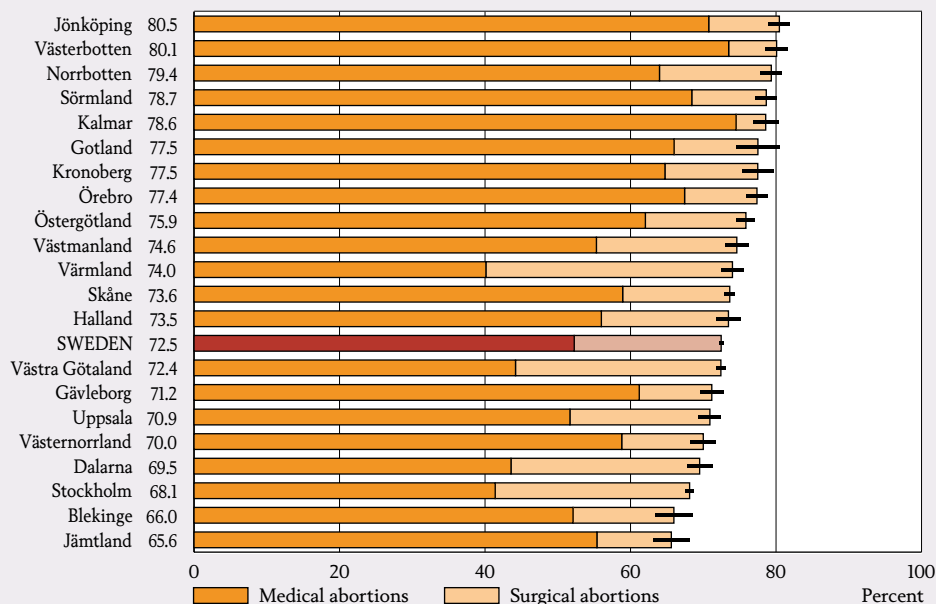


Figure A:16 Induced abortion – both medical and surgical, prior to the 9th week of pregnancy. 2004–2006. Percent.

Source: Centre for Epidemiology / The National Board of Health and Welfare

Induced abortion, both medical and surgical, prior to the 9th week of pregnancy (A:16)

Approximately 36 000 abortions were performed in Sweden in 2006. Some 26 000 of them were prior to the 9th week of pregnancy. Induced abortion prior to the 9th week is safer and more effective. Although abortion complications are uncommon, the risk increases with the term of pregnancy. Thus, it is important to minimise waiting times for abortions.

Prior to the 9th week of pregnancy, either a medical or surgical abortion can be performed. Surgery is most common after the 9th week. As a result, short waiting times are necessary to give the woman an opportunity to choose the method she prefers. Up to the 9th week, she can decide on the method herself as long as there are no medical obstacles.

Surgical abortion involves evacuation of the uterus under local or general anaesthesia. A medical abortion involves administering two rounds of drugs 2–3 days apart. The first round must be at a general hospital or another NBHW-approved health-care facility. The second round may be at home, assuming that certain criteria have been met.

A medical abortion may be performed immediately after a positive pregnancy test, while a surgical abortion is rarely performed before the 7th week of pregnancy. More than half of all abortions in Sweden over the past few years have been medical. More than 70 percent of abortions performed prior to the 9th week of pregnancy have been medical.

The NBHW's regional survey of abortions in early pregnancy found that average waiting times were somewhat longer for surgical than medical abortions.

Figure A:16 shows the percentage of abortions, both surgical and medical, prior to the 9th week of pregnancy in 2004 and 2006. The average was 72 percent, with a regional variation between 65 and 80 percent. More than 80 percent of abortions in Jönköping and Västerbotten were prior to the 9th week of pregnancy. The rate for Blekinge and Jämtland was 66 percent. Stockholm also had a relatively low rate of approximately 68 percent.

The majority of abortions prior to the 9th week were medical, but there were large regional variations. The regions with the greatest percentage of abortions prior to the 9th week also had a very high percentage of medical abortions.

Foetal mortality rate per 1 000 births (A: 17)

Foetal mortality is defined as the birth of a child without any signs of life after the 28th week of pregnancy. Foetal death may occur prior to or (the less usual case) during delivery. Foetal abnormalities, infections, serious disease in the mother and complications in the placenta and/or umbilical cord are among the causes of foetal death. But no obvious cause can be identified in 10–15 percent of the cases.

There are between 300 and 400 foetal deaths in Sweden every year. The percentage of foetal deaths has declined by more than 50 percent since 1970. One factor that may cause the number of foetal deaths to rise is the increasing age of women at the time of childbirth. Women age 35 and older are at greater risk than those age 20–34. Primiparas (women bearing a child for the first time) are also at greater risk.

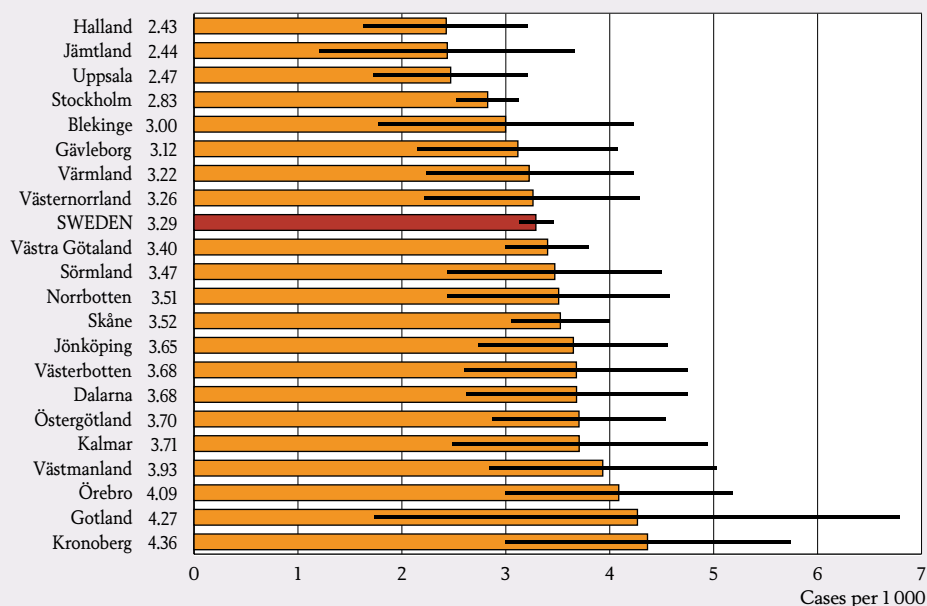


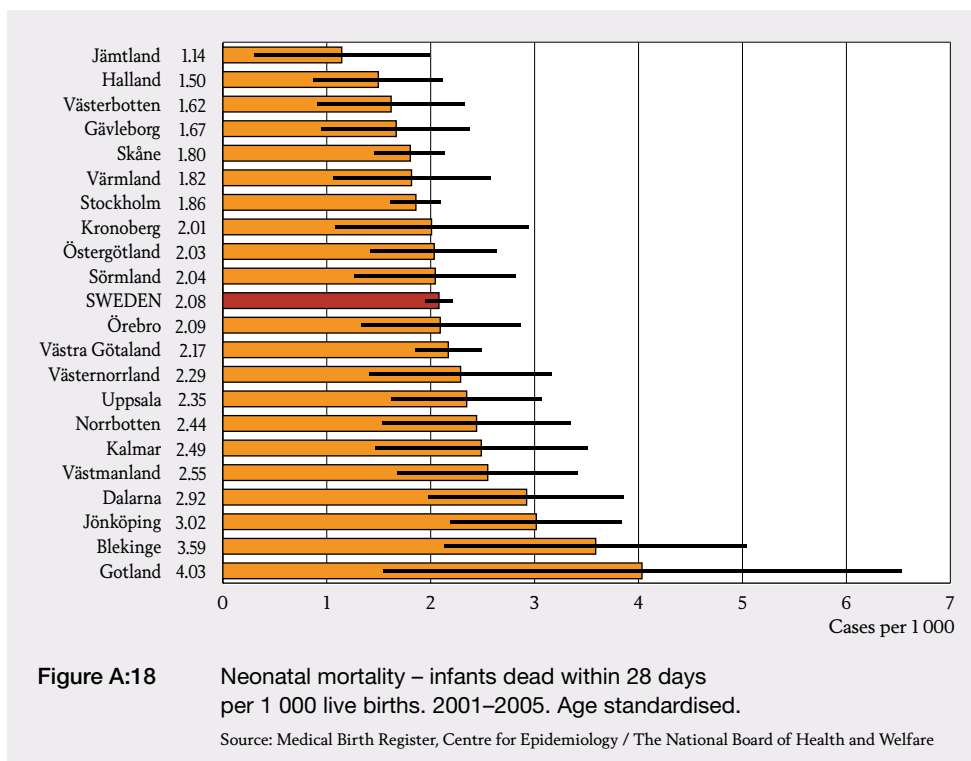
Figure A:17 Foetal mortality rate per 1 000 births.
2001–2005. Age standardised.

Source: Medical Birth Register, Centre for Epidemiology / The National Board of Health and Welfare

Smoking and overweight are the leading known preventable risk factors for intrauterine foetal death. By means of early monitoring and regular check-ups, the prenatal care system should reduce the risk.

According to comparisons performed by WHO Europe, Sweden has a very low foetal mortality rate.

The measure that we have used here is the number of foetal deaths per 1 000 births in 2001–2005. Figure A:17 presents the results. The national rate was 3.3 foetal deaths per 1 000 births. The regional variations were relatively great. Halland, Jämtland and Uppsala were lowest at just over 2 foetal deaths per 1 000 births. At over 4 per 1 000, the results for Kronoberg, Gotland and Örebro were almost twice as much. The figure shows that the statistical uncertainty was high, given that the actual numbers were very small.



Neonatal mortality rate per 1 000 live births (A:18)

The neonatal mortality rate measures the number of children who die within 28 days after birth. The rate may reflect the quality of both maternal and neonatal care. The neonatal mortality rate in Sweden has declined from over 5 per 1 000 live births in the early 1980s to 1.5–2.5 per 1 000 live births in the years presented here. That comes to 150–230 neonatal deaths per year.

Sweden has a low neonatal mortality rate compared with other European countries. According to WHO Europe's compilations, Sweden was among the five countries with the lowest rates in the early 2000s.

Neonatal mortality rates were lowest in Jämtland, Halland and Västerbotten. Gotland, Blekinge and Jönköping had the highest rates. Sweden as a whole had 2.1 neonatal deaths per 1 000 live births. The regional differences were significant even apart from the extremes, such as Jämtland's low 1.1 per 1 000. The statistical uncertainty was great, given that the actual numbers were very small.

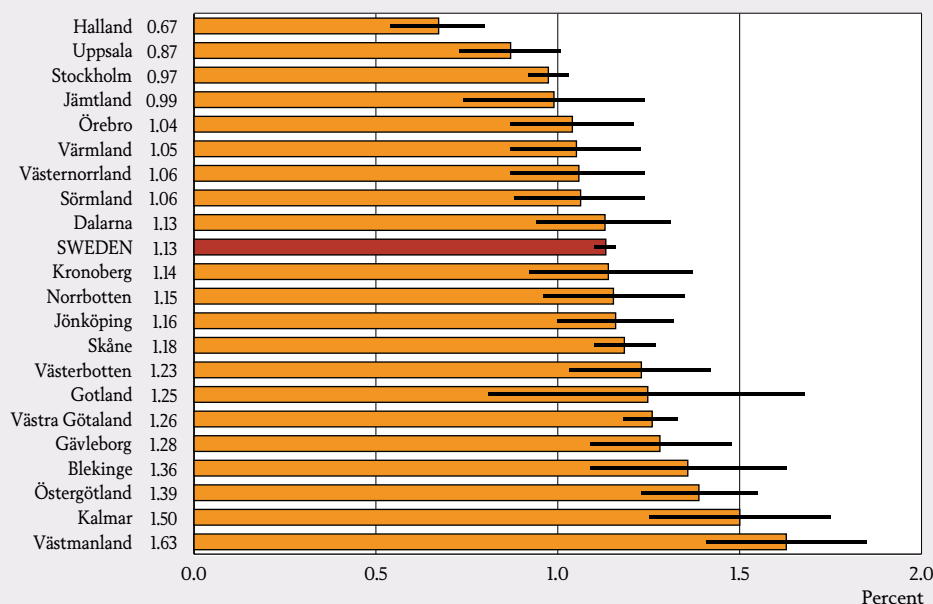


Figure A:19 Proportion of newborns with Apgar score under 7 at 5 minutes. 2001–2005. Age standardised.

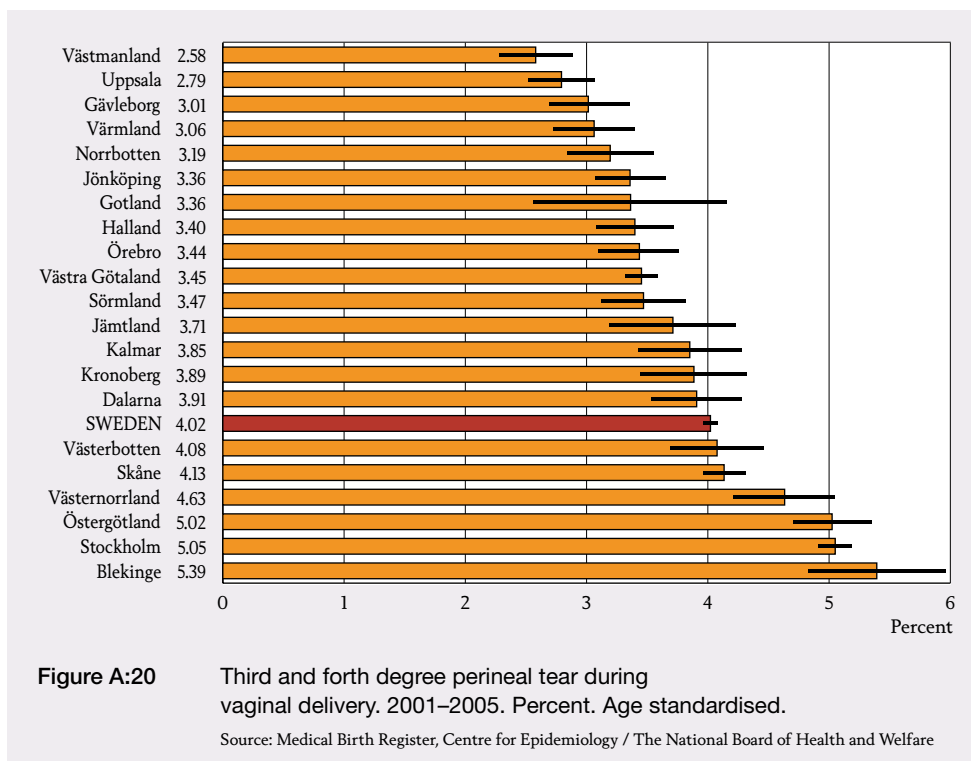
Source: Medical Birth Register, Centre for Epidemiology / The National Board of Health and Welfare

Proportion of newborns with Apgar score under 7 (A:19)

The Apgar score is a system for standardised assessment of the vitality of newborns. The newborn's heart rate, breathing, skin colouration, activity and muscle tone, and reflex irritability are rated on a scale of 0–2 at one minute, five minutes and ten minutes after birth. Thus, 10 is the highest possible Apgar score. A score below 7 at five minutes is normally defined as low.

A number of childbirth-related factors can lead to a low Apgar score at five minutes. Both mortality rates and the risk of serious neurological damage are greater in newborns with low Apgar scores at five minutes.

The smallest possible percentage of newborns with low Apgar scores is desirable. The national rate was just above 1 percent in 2001–2005, the period studied. The lowest percentage of babies with low Apgar scores were born in Halland, Uppsala and Stockholm. At 0.7 percent, Halland was clearly the best. The highest percentage of newborns with low Apgar scores were in Västmanland, Kalmar and Östergötland.



Third and fourth degree perineal tear during vaginal delivery (A:20)

Perineal tear is a rupture that can occur during childbirth in the soft tissues between the vaginal opening and anus. The known risk factors for perineal tear are that the woman is giving birth for the first time, is bearing a large child, has a protracted delivery and has an assisted delivery (the use of forceps or a ventouse).

The percentage of perineal tears has increased in the past two decades. While not fully known, the cause may be the greater number of assisted deliveries and the increasing size of babies. Perineal tears that remain undetected or are insufficiently treated lead to serious health problems for the woman.

Perineal tears are classified according to their scope, 3rd and 4th being the most extensive. Third and fourth degree perineal tears are generally sutured in the operation theatre, usually under spinal anaesthesia.

Most perineal tears heal well and the woman suffers no permanent harm. Nevertheless, they can lead to impaired mental and emotional wellbeing, including fears about incontinence, sexual performance and future pregnancy. Among the poten-

tial permanent complications are pain in the perineum, pain during intercourse and faecal incontinence.

In Sweden as a whole, 4 percent of vaginal deliveries were accompanied by third or fourth degree perineal tears. That translates into more than 3 000 women a year. The lowest percentages of perineal tears were in Västmanland, Uppsala and Gävleborg. The highest percentages were in Blekinge, Stockholm and Östergötland, all three of which significantly deviated from the majority of regions.

The variation among hospitals and regions suggests that the number of perineal tears can be affected and the frequency of childbirth injury thereby significantly reduced.

DIABETES CARE

Diabetes is a common chronic condition that increases the risk of other diseases. Over 350 000 Swedes, approximately 4 percent of the population, are estimated to have diabetes. Some 85–90 percent of them have adult (type 2) diabetes. The rest have juvenile (type 1) diabetes. For most diabetics, primary care constitutes their regular contact with the healthcare system. Others have contact with the healthcare system mainly through outpatient visits at hospitals and medical clinics.

There are a number of well-established quality indicators, along with associated treatment goals, for diabetes care. Among them are blood sugar (HbA1c), blood pressure and cholesterol levels, as well as smoking. Here we present two indicators with data from the National Diabetes Register (NDR) and two with data from the Prescribed Drug Register.

The NDR collects data about diabetes care from medical clinics and primary care facilities. The register estimates the national participation rate for 2006 at 43 percent, with large regional variations. Participation increased significantly from 2005 to 2006. The figures that use NDR data also present the participation rate by region. When the participation rate is low, the data are uncertain.

The NDR data are for diabetic patients of all ages in primary care in 2006. For these indicators, we follow the presentation in the NDR's latest annual report. The report contains a quality index that ranks the regions in accordance with five different measures. Both NDR indicators presented here are included in the index.

Goal fulfilment for the NDR indicators is specified in relation to the treatment guidelines and goals for blood pressure and blood sugar levels that the Swedish Association for Diabetology issues and that the NDR uses in its quality index. The NBHW has begun to revise the national diabetes guidelines in 2007.

The indicators based on data from the Prescribed Drug Register are a valuable supplement to the NDR data. The comprehensive register is based on prescriptions picked up by outpatients. But, as opposed to the NDR, the register does not provide data about goal fulfilment – such as cholesterol levels or blood pressure – for various treatment methods.

Diabetic patients in primary care who reach the goal for HbA1c levels (A:21)

Figure A:21 shows the percentage of patients in the National Diabetes Register who reached the goal for blood sugar (HbA1c) levels. The treatment goal was an HbA1c level of 6.0 percent or below.

All of the almost 115 000 patients reported in primary care were included. The regional differences were generally modest and should not be ascribed excessive importance, particularly in view of the varying participation rates. Dalarna, Norrbotten and Gotland reported low percentages. Of those regions, Norrbotten and Gotland had low participation rates, while Dalarna had one of the highest nationwide.

Of the regions above the national average, Östergötland had the highest participation rate (over 80 percent) and thereby reliable data. Of the other regions above the

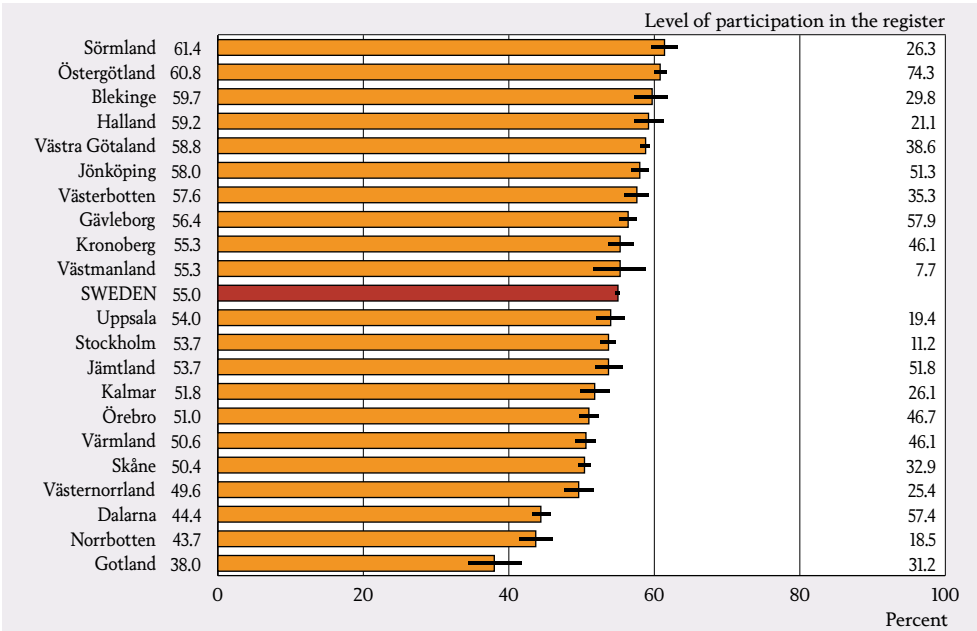


Figure A:21 Diabetic patients in primary care who reach the goal for HbA1c (HbA1c ≤ 6.0 %), 2006. Percent. Right hand column percentages refers to level of participation in the register.

Source: National Diabetes Registry

national average, Jönköping, Gävleborg and Kronoberg also had relatively high participation rates. A total of 55 percent of patients nationwide reached the treatment goal, unchanged from 2005.

Diabetic patients in primary care who reach the blood pressure goal (A:22)

According to various studies, diabetics run a 2–3 times increased risk of developing cardiovascular disease. A number of risk factors – including hypertension, elevated blood lipids and smoking – are involved. The overall risk rises with the number of risk factors. The limit for elevated blood pressure in diabetics has been set at 130/80 mm Hg. Based on that limit, 80–90 percent of all diabetics have hypertension.

Figure A:22 shows the percentage of the same group of patients that reached the treatment goal of 130/80 mm Hg or below. All patients, whether or not they were treated for hypertension, were included. The proportion that reached the goal (33 percent) was substantially below the corresponding result for blood sugar levels (55 percent). Östergötland and Värmland had a relatively high percentage of patients who reached the treatment goal while also reporting relatively high participation rates.

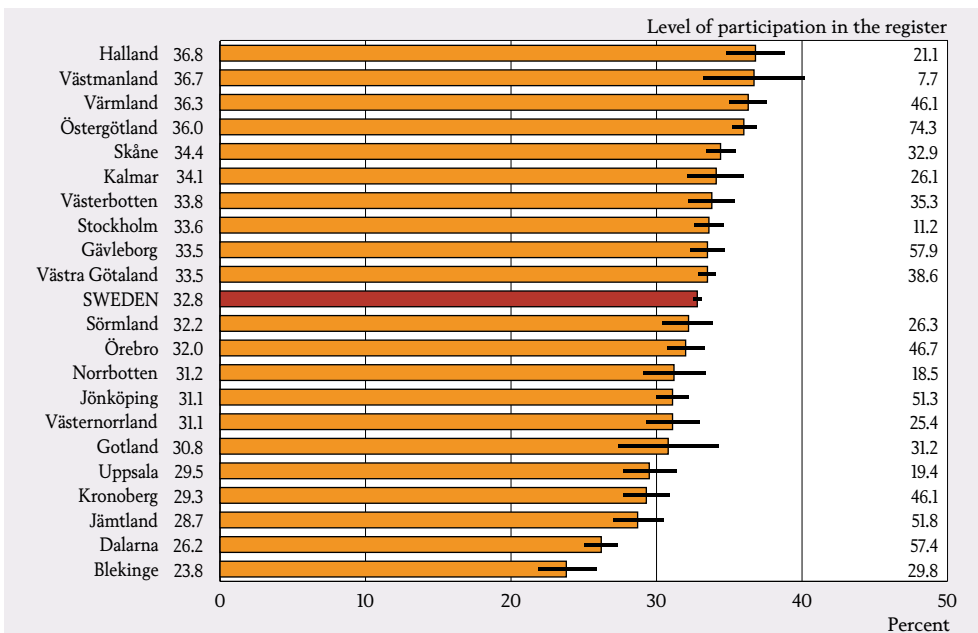


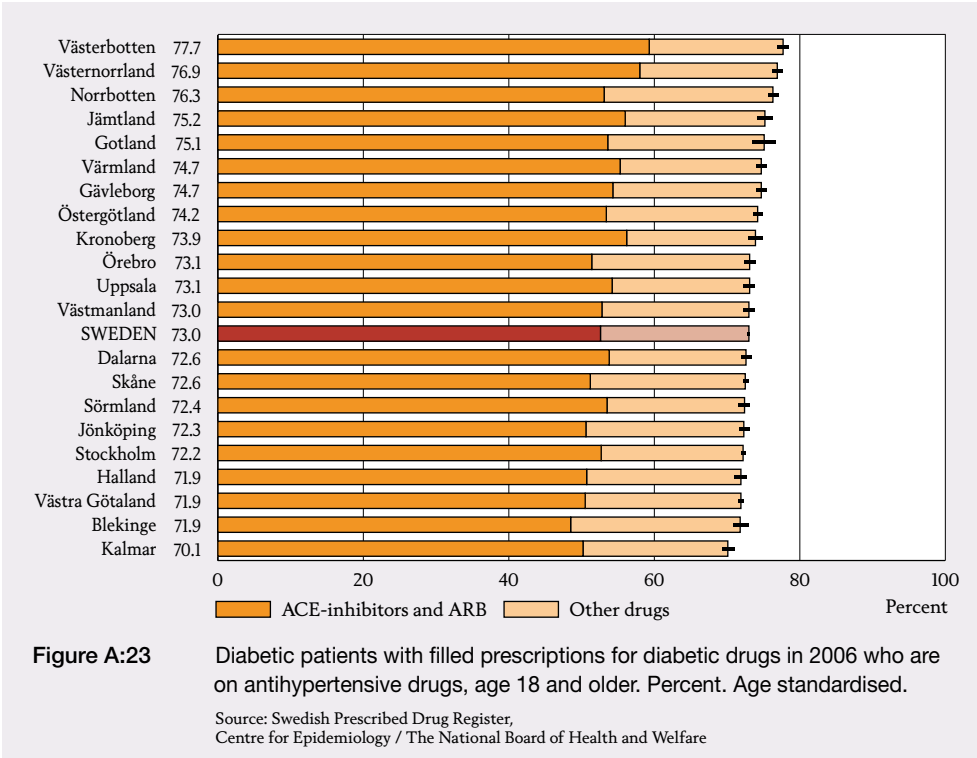
Figure A:22 Diabetic patients in primary care who reach the blood pressure goal. (BP <= 130/80), 2006. Percent. Right hand column percentages refers to level of participation in the register.

Source: National Diabetes Registry

Goal fulfilment of 33 percent is strikingly low. The proportion of patients treated for hypertension who reached the goal was lower (25 percent) according to the NDR data. The low goal fulfilment points to undertreatment of the diabetic population. But it should be noted that the choice of treatment must be based on individual considerations. For the elderly and people with concurrent diseases, a number of different factors must be taken into account.

Diabetic patients receiving antihypertensive therapy (A:23)

Figure A:23 is based on data from the Prescribed Drug Register. The first step identifies all diabetics in Sweden age 18 and older who picked up prescriptions for diabetes drugs in 2006. The next step examines the percentage of that group who received some kind of antihypertensive therapy. In addition, the percentage of all patients who received antihypertensive therapy with ACE inhibitors or Angiotensin II antagonists (ARBs) was examined. Those drugs are to be particularly used as anti-hypertensive therapy in diabetic kidney disease, which a significant percentage of diabetics have, as well as certain other cases.



A total of 73 percent of diabetic patients nationwide received some kind of antihypertensive therapy. The corresponding NDR result for 2006 was 70 percent, which tallies well with the Prescribed Drug Register data.

With an interval of 70–78 percent, the regional differences were strikingly small. The spread was also modest (50–60 percent for almost all regions) when it came to treatment with ACE inhibitors and ARBs.

The small regional differences are a sign that diabetes care is of uniform quality in this respect. But in relation to the NDR goals, diabetic patients appear to be generally undertreated. The low goal fulfilment for blood pressure levels (see indicator A:22) suggests that is the case. The revision of the national diabetes guidelines will provide some direction on this issue.

Diabetic patients treated with blood lipid lowering drugs (A:24)

Indicator A:24 is also based on Prescribed Drug Register data but covers the population age 40 and older. Using the same methodology as above, it shows the percentage of diabetics receiving drug therapy who were treated with blood lipid lowering drugs. The national result was 50 percent. All regions apart from Gotland were in the 45–55 percent interval, a relatively modest spread.

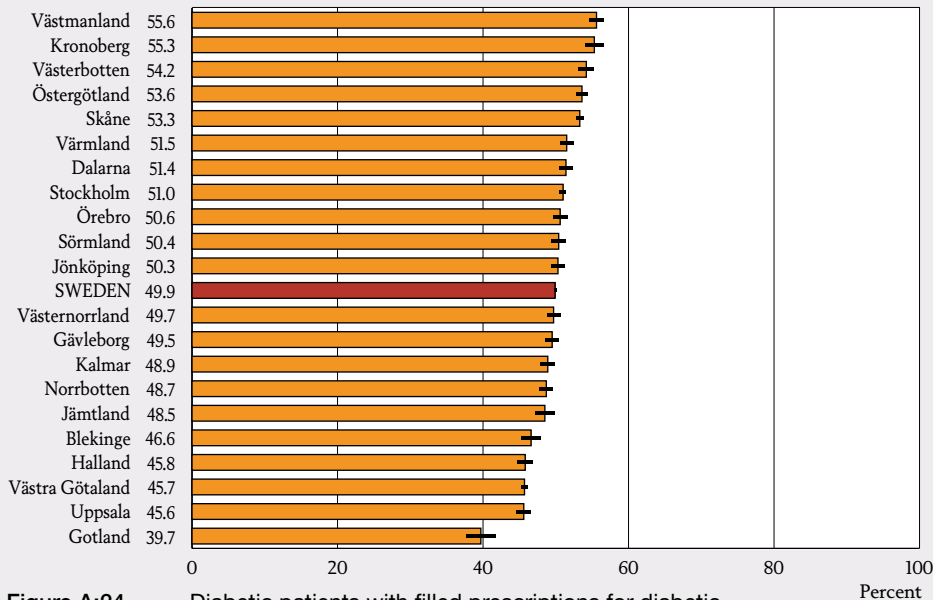


Figure A:24

Diabetic patients with filled prescriptions for diabetic drugs in 2006 who are on blood lipid lowering drugs, age 40 and older. Percent. Age standardised.

Source: Swedish Prescribed Drug Register,
Centre for Epidemiology / The National Board of Health and Welfare

The data agree with the corresponding results from the NDR in terms of both the national rate and regional differences. According to the NDR, approximately 50 percent of patients treated for high blood lipids reached the goal for total cholesterol of <4.5 mmol/L and for LDL cholesterol of <2.5 mmol/L. The percentage has increased in recent years. Approximately 30 percent of patients who were not treated for high blood lipids reached the goals.

The 50 percent goal fulfilment result is unsatisfactory and points to undertreatment. An interesting question is whether a correlation exists between the percentage of patients treated in the various regions (according to the Prescribed Drug Register) and the percentage who reached the total cholesterol goal of <4.5 mmol/L (according to the NDR). That question should be examined further based on data from both registers.

STROKE CARE

Stroke is a common disease that claims major resources of both the healthcare system in general and long term care for the elderly in particular. Approximately 35 000 Swedes, essentially an equal number of women and men, have strokes every year. Stroke is the third most common cause of death after myocardial infarction and cancer. The number of stroke cases has declined somewhat since 2000. While hospital length of stay averaged 13 days, many patients needed substantial care and rehabilitation afterwards.

We present six indicators for stroke care. The two indicators that concern fatality rates after stroke were taken from the Patient Register, the Cause of Death Register, and the Total Population Register. One of the two indicators that were taken from the National Quality Register for Stroke concerns how stroke care is carried out, whereas the other indicator concerns results in terms of loss of function for patients. The last two indicators look at secondary prevention after stroke

All hospitals that care for stroke patients during the acute phase participate in the National Quality Register for Stroke. The register contained more than 24 000 care events in 2006. In addition to keeping data about the acute phase, follow-up is performed after three months. The National Quality Register for Stroke's participation rate vis-à-vis the Patient Register is tracked on an annual basis. It is the only national healthcare quality register that follows such procedures. Approximately 85 percent of all Swedish stroke cases were in the register in 2005. The participation rate vis-à-vis the Patient Register has not yet been calculated for 2006. All data from the National Quality Register for Stroke are classified according to the location of the hospital, not the patient's region of domicile.

Stroke – 28-day case fatality rate (A:25)

The OECD uses the case fatality rate for stroke as an indicator of healthcare quality in international comparisons. The measure presented here examines quality throughout the healthcare system: preventive, ambulance, acute and follow-up care.

Stroke is defined as all cases that include a diagnosis of cerebral haemorrhage, cerebral infarction or unspecified stroke in the inpatient section of the Cause of Death Register or Patient Register. Thus, both patients who were hospitalised and those who died without being hospitalised are included. The comparison includes only people who have not had a stroke during the seven preceding years.

Approximately 23 percent of these stroke cases died in 2002–2004. After adjusting for differing age structures, the case fatality rate was very similar for women and men.

Figure A:25 shows that there was some regional variation in the case fatality rate. Among the possible causes of the variation are diagnostic reliability, background factors such as concurrent diseases, social variables, random parameters, care of stroke patients and the propensity of the population to seek care. Care-related factors may include distance to satisfactory facilities, the efficiency of ambulance services and acute hospital care.

Gotland, Kalmar and Blekinge had the highest case fatality rates for men. Uppsala, Västmanland and Halland had the lowest. For women, Gävleborg, Värmland and Östergötland had the highest rates during the three years, while Uppsala and Gotland had the lowest. Thus, Gotland had the highest rate for men but a very low rate for women.

The figures have been assigned 95 percent confidence intervals. The intervals demonstrate that random variation over time can significantly affect the rates, particularly for regions like Gotland with small populations.

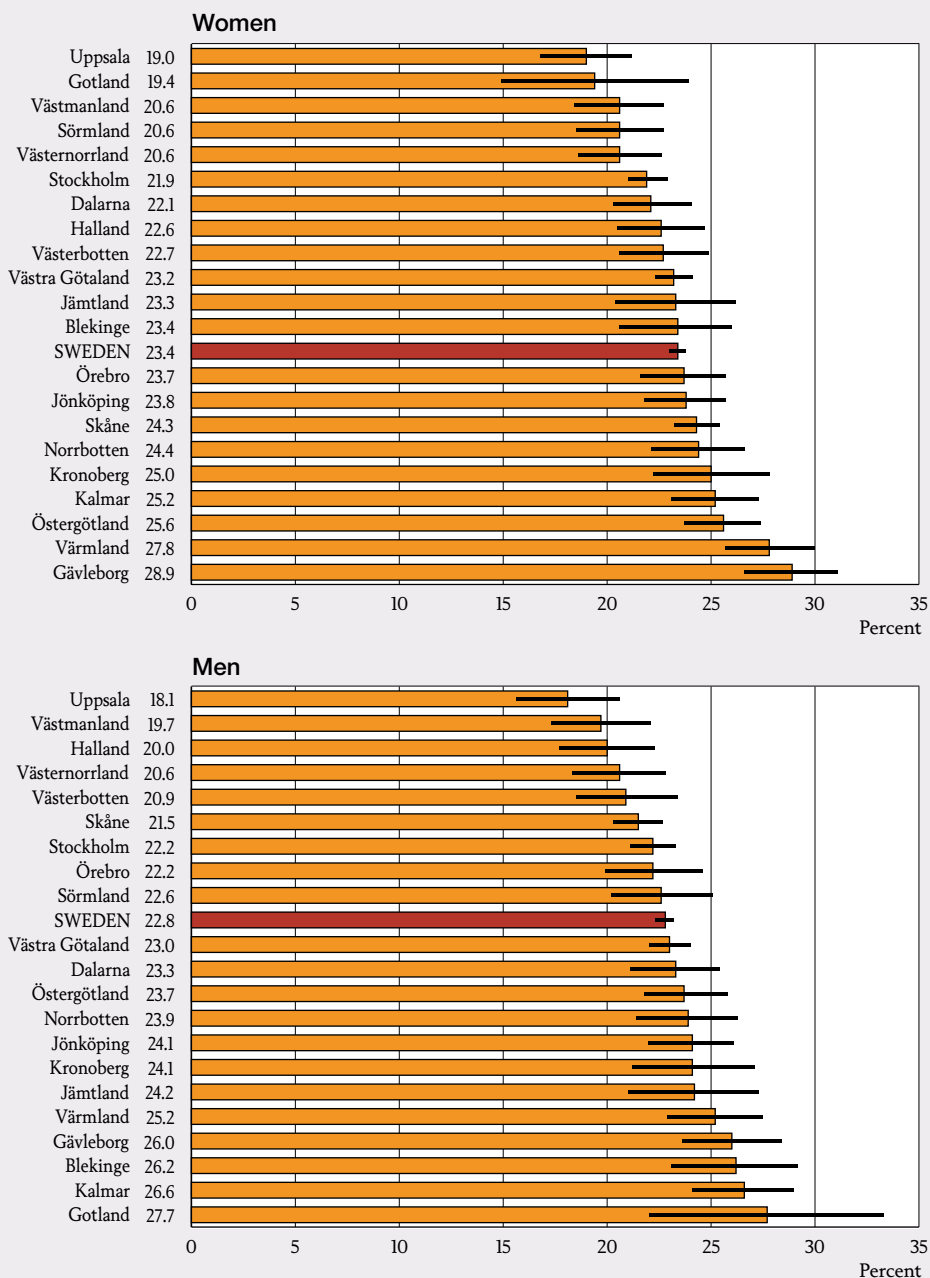


Figure A:25

Stroke – 28-day case fatality rate. First time stroke, both hospitalised cases and those who died without being hospitalised. 2002–2004. Percent. Age standardised.

Source: Patient Register and Cause of Death Register, Centre for Epidemiology / The National Board of Health and Welfare

Stroke – 28-day case fatality rate – hospitalised patients (A:26)

This indicator reflects the 28-day case fatality rate for hospitalised stroke patients. The measure focuses on quality in acute and continuing care at the hospital.

International comparisons by the OECD, the Nordic cooperation and other bodies use various measures of case fatality rates for stroke. Short-term survival exclusively among hospitalised stroke cases is a common measure and the only one that is available in many countries.

Of the more than 17 000 men and 18 000 women who have strokes in Sweden each year, approximately 30 000 receive hospital care.

Figure A:26 shows that 15 percent of all hospitalised cases died within 28 days after stroke. After adjusting for differing age structures, the national case fatality rate – both after hospital care and as a whole – was very similar for women and men.

The case fatality rate for hospitalised men varied from 10 percent in Uppsala to 18 percent in Gävleborg and 20 percent in Kalmar. Those three regions ranked similarly when comparing the case fatality rate for all stroke cases. The case fatality rate for hospitalised women was similar – 13 percent in Västmanland, Dalarna and Västernorrland, and approximately 19 percent in Värmland and Kronoberg.

The data in the figures are age-standardised and have been assigned 95 percent confidence intervals. The intervals demonstrate that random variation over time can significantly affect the rates, particularly for regions with small populations.

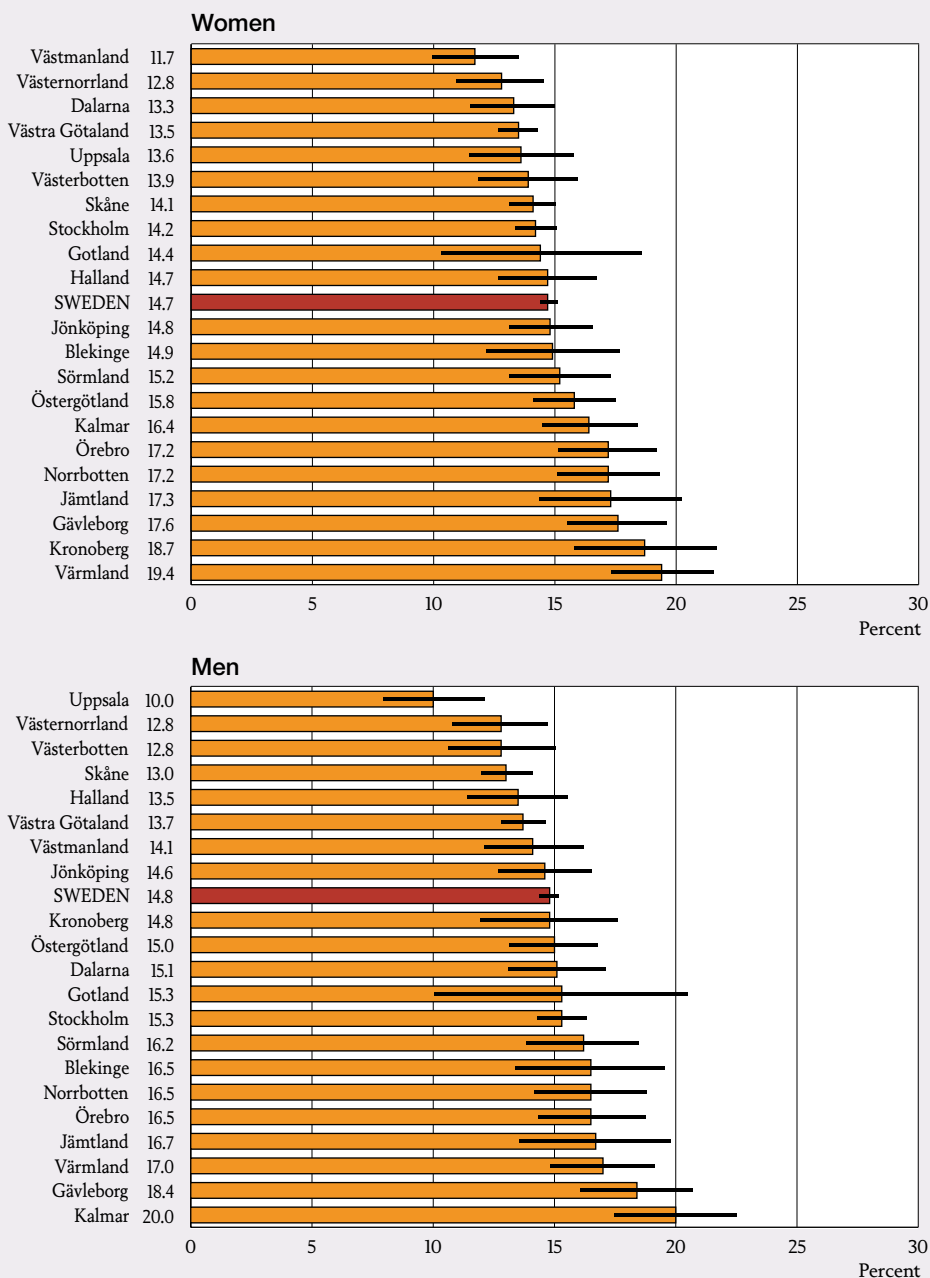


Figure A:26

Stroke – 28-day case fatality rate. First time stroke, hospitalised cases. 2002–2004. Percent. Age standardised.

Source: Patient Register and Cause of Death Register, Centre for Epidemiology / The National Board of Health and Welfare

Patients treated at a stroke unit (A:27)

According to the national guidelines, care during the acute phase of stroke is to be provided at special stroke units. There is a strong empirical basis for maintaining that care at well-functioning, special stroke units reduces fatality rates, personal dependence and the need for institutional living. All stroke patients benefit, regardless of age, gender or severity of brain injury. Thus, the guidelines give top priority to care at a special stroke unit.

The number of Swedish stroke patients who were treated at special stroke units for all or part of the period of their care rose steadily from 1994–2006. Figure A:27 Nationwide tracks that trend.

As illustrated by Figure A:27, reported separately for women and men, there were rather large regional differences. The national result was almost 82 percent in 2006. For women, the differences were more than 15 percentage points among some regions. The differences for men were somewhat smaller.

The proportion of patients treated at special stroke units was a couple of percentage points higher for men than women. According to the 2006 National Quality Register for Stroke annual report, men had almost a 10 percent better chance of being treated at a special stroke unit than women even after adjustments had been made for variables such as age, level of awareness and previous stroke. Jämtland, Kalmar and Värmland showed women at the greatest disadvantage – though without the above adjustments.

The average age of patients was somewhat lower at special stroke units (76) than ordinary outpatient clinics (79). The National Quality Register for Stroke annual report indicates that the greatest age differences in that respect (more than 5 years) were in Halland, Jämtland, Stockholm, Uppsala and Västernorrland.

Due to lower participation rates, the data for regions whose bars in the figure are other than bright orange are regarded as uncertain. The 2003–2005 National Quality Register for Stroke participation rate vis-à-vis the Patient Register was used for that purpose. Regions with 20 percent or higher rates that reported to the Patient Register but not the National Quality Register for Stroke are deemed to have uncertain data. One drawback is that the 2006 participation rates could not be used.

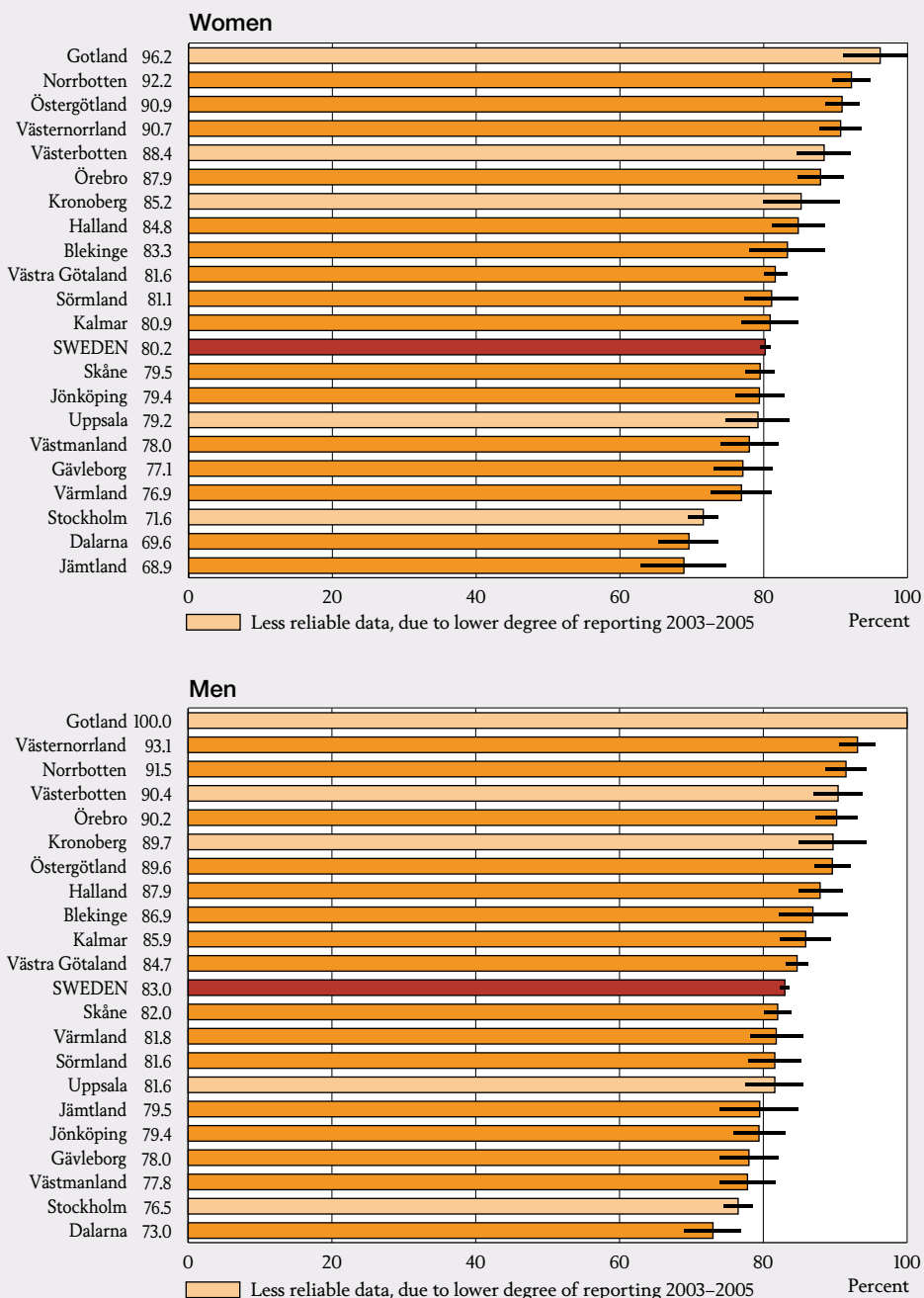


Figure A:27

Patients treated at stroke unit. 2006. Percent.

Source: National Quality Register for Stroke

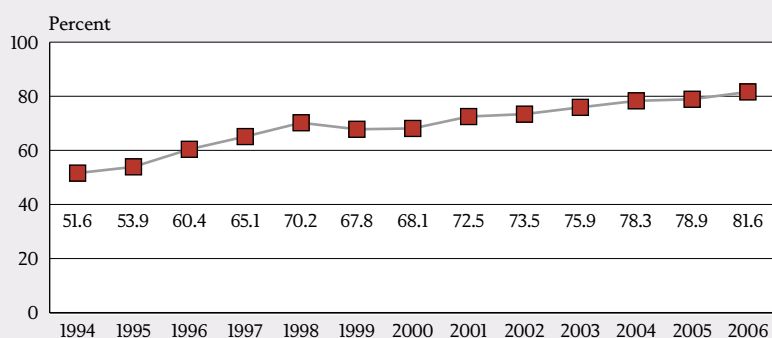


Figure A:27
Sweden

Patients treated at stroke unit. 2006. Percent.

Source: National Quality Register for Stroke

Activities of daily living (ADL) ability three months after stroke (A:28)

Stroke survivors recover pre-disease function to different degrees. The National Quality Register for Stroke collects data about the dependence of patients on others for their personal ADLs three months after stroke. Personal ADLs refer to locomotion, toileting, dressing and undressing. As a quality indicator, the measure reflects healthcare interventions both during the acute phase and in ongoing rehabilitation after discharge from the acute care hospital.

In addition to differing participation rates, dropouts in the three-month follow-up are a source of error. Stockholm and Gotland had dropout rates above 20 percent. They are highlighted in the figure as regions with uncertain data.

Figure A:28 presents the percentage of patients who could handle their personal ADLs by themselves prior to stroke, who survived and who were dependent on others for these activities three months after the acute phase. The percentage of patients who were dependent showed a regional variation of 17–28 percent in 2006. The nationwide result was 20.5 percent. The percentage of Swedish stroke patients who are dependent on others for their personal ADLs at three-month follow-up has trended downward since 2003.

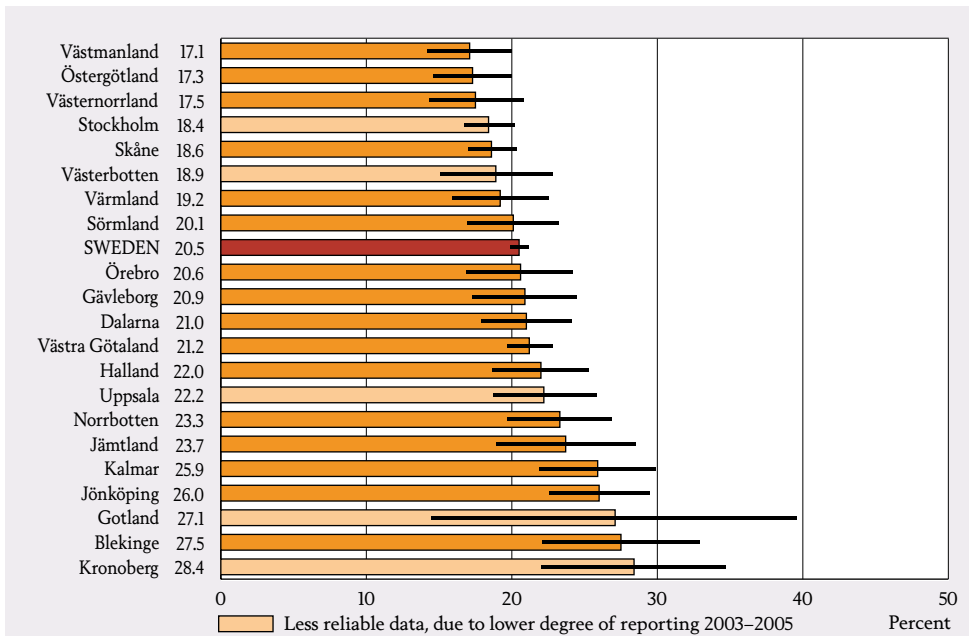


Figure A:28 Stroke patients dependent on others for activities of daily living (ADL) ability three months after stroke. 2006. Percent.
Source: National Quality Register for Stroke

This measure should preferably be interpreted along with the percentage of survivors: Hospitals and regions achieve the best results when they have a high percentage of patients who survive and a high percentage who are independent when it comes to personal ADLs, i.e., recover their pre-disease function to a large degree.

Data broken down by hospital

As an illustration, Figure A:28 Hospitals shows the results per clinic in accordance with the clinic/hospital breakdown used by the National Quality Register for Stroke. Not surprisingly, the variation is greater than among the regions. Given that only one year's results are presented, the confidence intervals are also wider.

One group of hospitals had results below 15 percent, while another group had results of 25 percent and above. The bars for hospitals with low participation rates and/or high dropout rates at three-month reporting are other than bright orange.

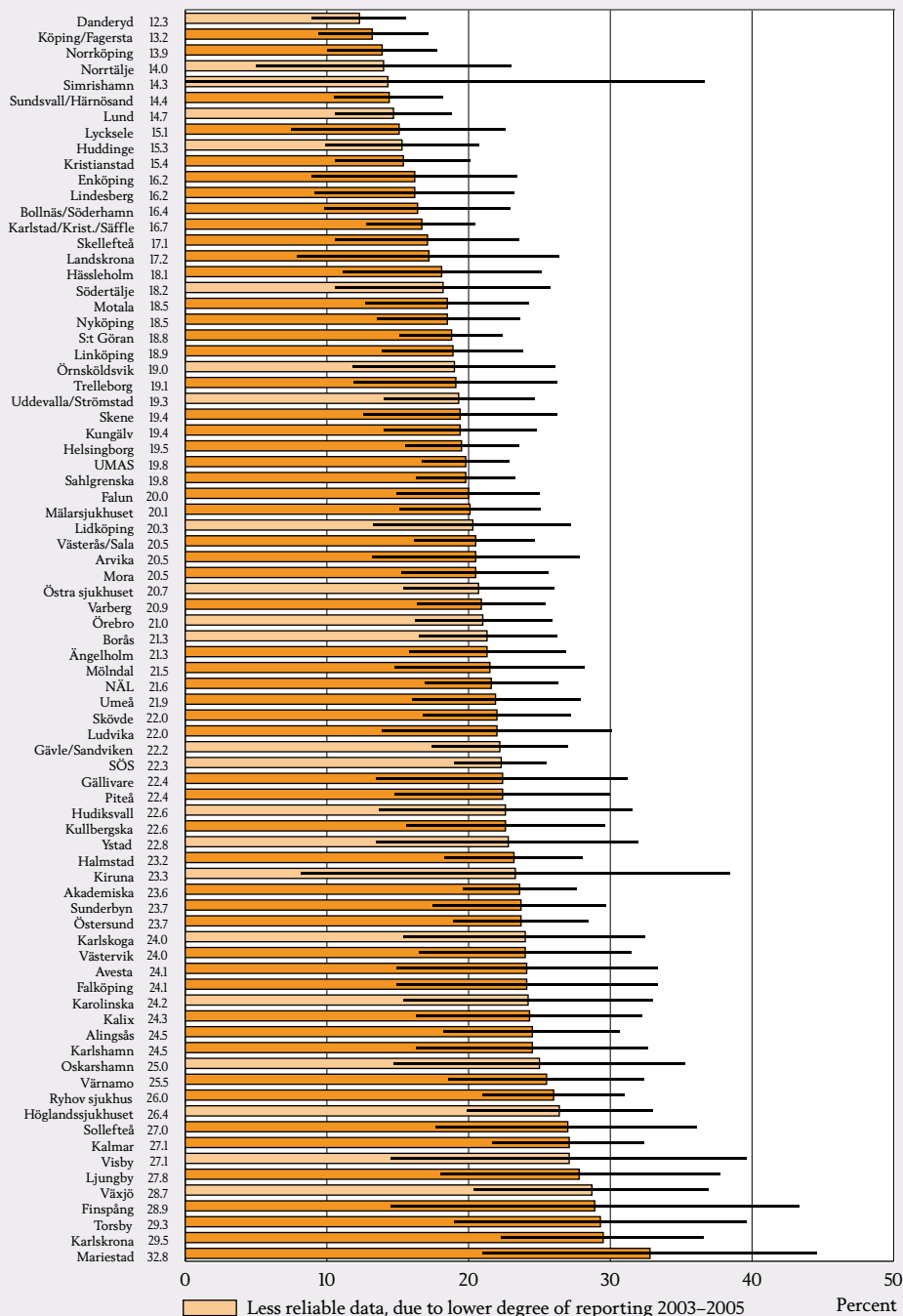


Figure A:28
Hospital

Stroke patients dependent on others for activities of daily living (ADL) ability three months after stroke. 2006. Percent.

Source: National Quality Register for Stroke

Anticoagulant therapy after stroke (A:29)

A large number of Swedes (more than 90 000) have chronic atrial fibrillation. The condition is one of the most common causes of stroke. Approximately 6 000 Swedes have a stroke every year due to atrial fibrillation. It is also a key risk factor for stroke recurrence. Warfarin therapy after stroke and for atrial fibrillation leads to a considerably lower risk for recurrence of stroke or other cardiovascular disease.

Warfarin after stroke or for atrial fibrillation is a high-priority therapy in the national stroke guidelines. Essentially all of these patients should be given anticoagulant therapy with warfarin, albeit after taking concurrent disease, very advanced age and other individual factors into consideration.

Figure A:29 presents the number of female and male stroke patients with atrial fibrillation who received anticoagulant therapy. Based on the Patient Register and Prescribed Drug Register, the data cover patients who were discharged from hospital after stroke in 2005 and 2006 and who picked up prescriptions for anticoagulants during the first six months of 2007. Almost 6 000 stroke patients had atrial fibrillation.

Given that 50 percent of men and 41 percent of women nationwide received therapy, undertreatment was substantial. But the issue must be discussed and interpreted in view of the fact that warfarin may be contraindicated in elderly patients due to variables such as dementia and tendency to fall.

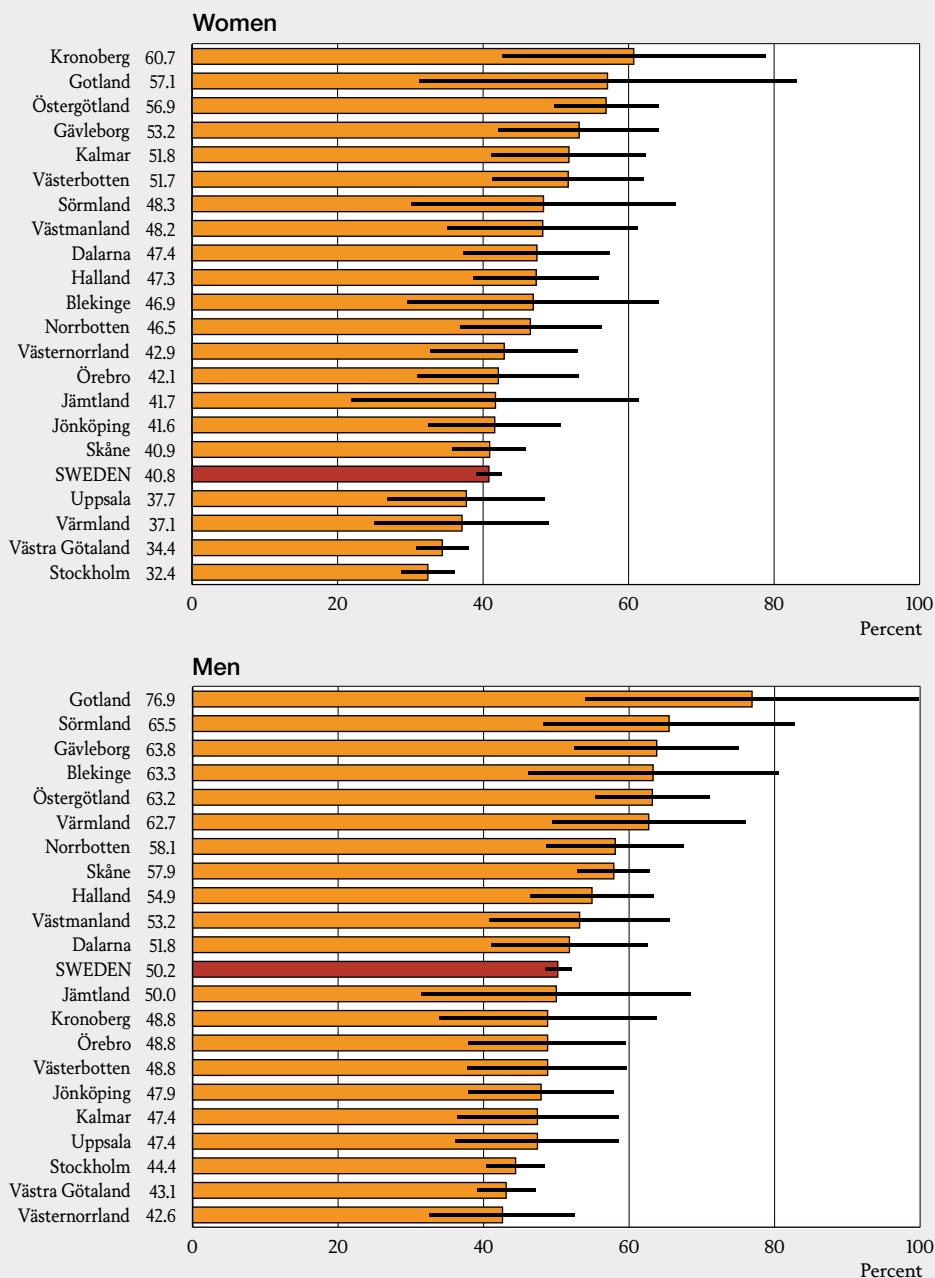
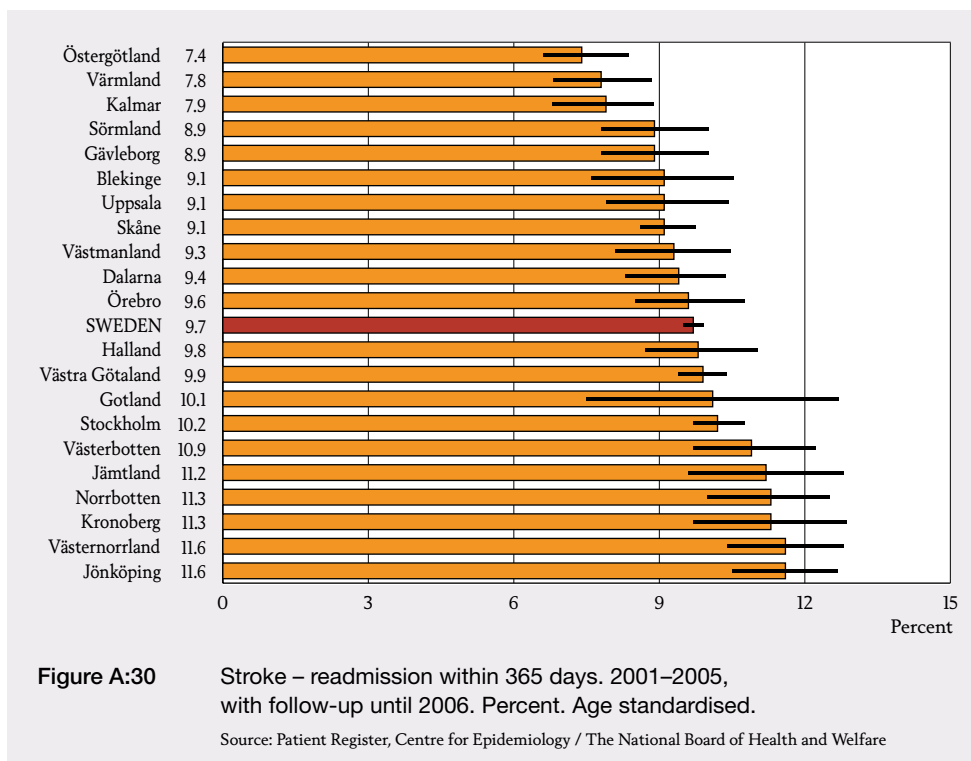


Figure A:29 Stroke patients with atrial fibrillation who received anticoagulant therapy. Jan–June 2007. Percent.

Source: Patient Register and Swedish Prescribed Drug Register, Centre for Epidemiology / The National Board of Health and Welfare



Stroke – readmission within 365 days (A:30)

The percentage of readmission to hospital among stroke patients can provide a measure of secondary preventive interventions after stroke. Among such interventions are influencing lifestyle by smoking cessation, dietary counselling, assistance with physical activity, drug therapy (antihypertensives, lipid lowering drugs and antithrombotics) and carotid surgery. The risk of recurrence is also dependent on other, hitherto unexplained, factors– the risk is greatest in northern Sweden and least in southern Sweden.

Figure A:30 shows the percentage of patients who were readmitted to hospital after stroke within a year of their initial care episode. The calculations for the figure are based on approximately 83 000 people in the Patient Register who were treated in 2001–2005 for first-time stroke with the primary diagnosis of cerebral haemorrhage, cerebral infarction or unspecified stroke and who survived the first year after stroke. The Patient Register has been followed up until the end of 2006. Age standardisation has been performed based on Swedish stroke patients as the standard population. The regional breakdown proceeds from each patient’s domicile.

More than 8 000 patients were readmitted for stroke or late effects of stroke. The nationwide readmission rate of over 9 percent showed no major difference between men (10.2 percent) and women (9.3 percent). The regions varied quite modestly between 7.3 percent and 11.4 percent. Östergötland, Kalmar and Värmland were all below 8 percent, while Västernorrland and Jönköping were highest with 11.5 percent.

To sum up, the risk of stroke recurrence is significant. The healthcare system's cumulative secondary preventive measures are vital and can probably affect the risk of recurrence. For each region to monitor the impact of targeted measures and the like, repeated studies over time are required.

CARDIAC CARE

Cardiovascular disease is the most common cause of death and among the most common causes of disability in Sweden. Acute myocardial infarction, of which there were more than 36 000 cases in 2004, is the cardiovascular disease that causes the most deaths. Rapid changes in the treatment of myocardial infarction over the past ten years have lead to significantly lower fatality rates both at hospital and during the succeeding year. The number of myocardial infarction cases has also decreased.

Many new treatment methods have become well established and are used relatively uniformly at most hospitals. The methods for which the variations are greatest are those that involve the introduction of new drugs or that demand extra technical resources requiring special medical expertise and equipment or the transfer of the patient to another hospital.

All of the indicators concern myocardial infarction, either directly or indirectly. Two indicators examine fatality within 28 days as a performance measure of cardiac care. Four indicators measure process, reflecting how effectively myocardial infarction care handles treatment and secondary prevention. The final indicator presents the waiting times for cardiac surgery faced by the populations of the various regions.

While each figure is accompanied by a description of sources, the Registry on Cardiac Intensive Care (RIKS-HIA) is the source for three indicators and deserves a more thorough, cohesive discussion.

RIKS-HIA contains data about the myocardial infarction patients admitted to cardiac intensive care units at hospitals. Almost all acute care hospitals in Sweden participate in the register. But a small percentage of patients at each hospital may not be included in the database because they are treated at other wards. The participation rate of RIKS-HIA vis-à-vis the Patient Register is not currently reported on a regular basis. A recent survey in Västra Götaland led to the assessment that it had an 85 percent participation rate in 2005.

As in the previous report, the results for Norrbotten are incomplete. Three hospitals in the region did not report any data for 2006. They have decided to participate in RIKS-HIA.

Hospitals report to RIKS-HIA based on where they are located regardless of the patient's region of domicile. If a patient is referred to a hospital in another region, the case is included in the data for the region in which the first hospital is located.

Myocardial infarction – 28-day case fatality rate (A:31)

The 28-day case fatality rate is an established indicator of how well the healthcare system handles acute care after myocardial infarction. A number of international organisational initiatives, including the OECD and the World Health Organization MONICA (Multinational Monitoring of Trends and Determinants in Cardiovascular Disease) Project, use the indicator. The measure presented here examines quality throughout the healthcare system: preventive, ambulance, acute and follow-up care.

Myocardial infarction here refers to all cases in the inpatient care section of the Cause of Death Register or Patient Register in 2002–2004 for which the disease had been diagnosed. Thus, both patients who were initially hospitalised and those who died without being hospitalised are included. The data are age-standardised.

The regional variation in case fatality rates may have several causes. In addition to diagnostic reliability, background factors such as concurrent diseases, social variables, random parameters, care of myocardial infarction patients and the propensity of the population to seek care all have an impact. Direct care-related factors may include distance to an acute care hospital, the efficiency of ambulance services and acute hospital care. The 28-day case fatality rate has declined in all regions since the 1990s.

More than 21 000 men and 15 000 women had myocardial infarction in 2004. That represented a distinct decrease from previous years. Almost one third of the patients died within 28 days after myocardial infarction. The 28-day case fatality rate declined in nearly every region during the 1990s. The age-standardised rate declined by 10 percentage points for both women and men between 1990 and 2000.

For 2002–2004, men had the highest 28-day case fatality rate in Örebro, Stockholm and Blekinge, as well as the lowest rate in Uppsala, Kronoberg and Halland. Nationwide, the age-standardised rate for men varied from 26.4 percent in the lowest region to 37.2 percent in the highest.

Örebro had a high case fatality rate for women as well. Kalmar and Sörmland were also among the regions with the highest rates. As with men, women in Uppsala and Kronoberg had relatively low fatality rates after myocardial infarction. Age-standardised rates varied by approximately 10 percentage points among the different regions.

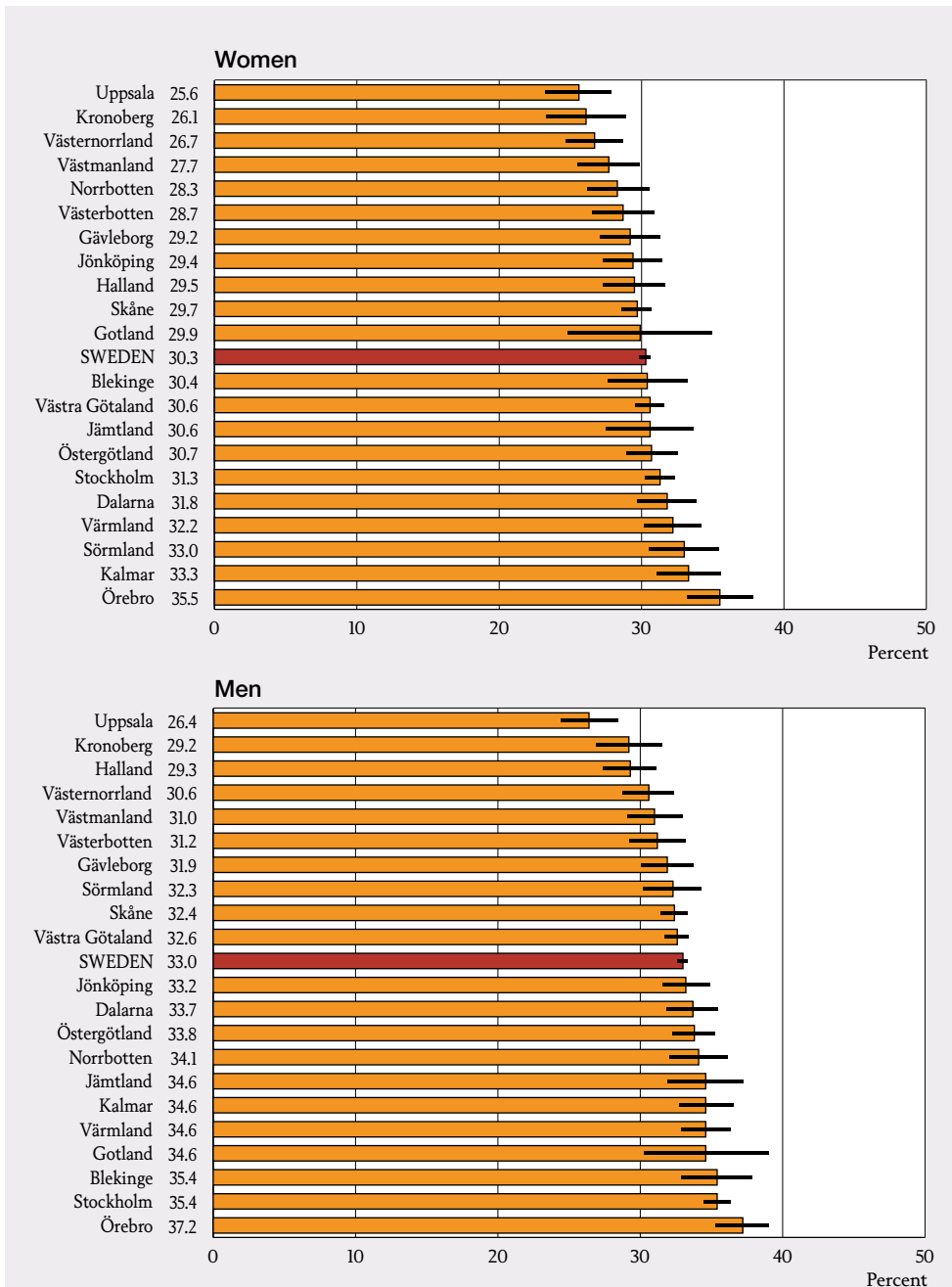


Figure A:31 Myocardial infarction – 28-day case fatality rate. First time myocardial infarction, both hospitalised cases and those who died without being hospitalised. 2002–2004. Percent. Age standardised.

Source: Patient Register and Cause of Death Register,
Centre for Epidemiology / The National Board of Health and Welfare

Myocardial infarction – 28-day case fatality rate – hospitalised patients (A:32)

This measure focuses on the quality of acute treatment of myocardial infarction patients and continuing care at the hospital. The indicator is also well established internationally. In comparison with the other centres in 24 countries, the two Swedish centres that participated in the MONICA project reported very low case fatality rates among hospitalised myocardial infarction patients. Short-term survival exclusively among hospitalised patients is a common measure and the only one that is available in many countries.

Myocardial infarction refers here to all initially hospitalised cases for which the disease was diagnosed in 2004–2006. All cases in which the patient was 20 or older were included. Age standardisation was performed in view of the differing gender and regional age structures.

Of the more than 21 000 men and 15 000 women who had myocardial infarctions in 2004, approximately 17 500 men and 12 500 women were hospitalised. Among all hospitalised myocardial infarction patients in 2004–2006, approximately 16 percent died within 28 days and one third within a year. With age standardisation, men had somewhat higher case fatality rates than women.

Örebro had the highest percentage of fatalities among hospitalised myocardial infarction patients – 20 percent for men and almost 19 percent for women. Uppsala, Blekinge and Kronoberg had the lowest case fatality rates among men. Their age-standardised rate was below 14 percent. Among women, who generally had lower case fatality rates after myocardial infarction than men, Gotland, Blekinge and Sörmland reported age-standardised rates of 12–13 percent.

Thus, after taking the differing age structures into consideration, men showed higher case fatality rates following myocardial infarction than women, both in the category of everyone who had an infarction and the category of everyone who was hospitalised. But the gender difference was greater in the category of everyone who had an infarction. The gap between men and women was narrower for hospitalised patients.

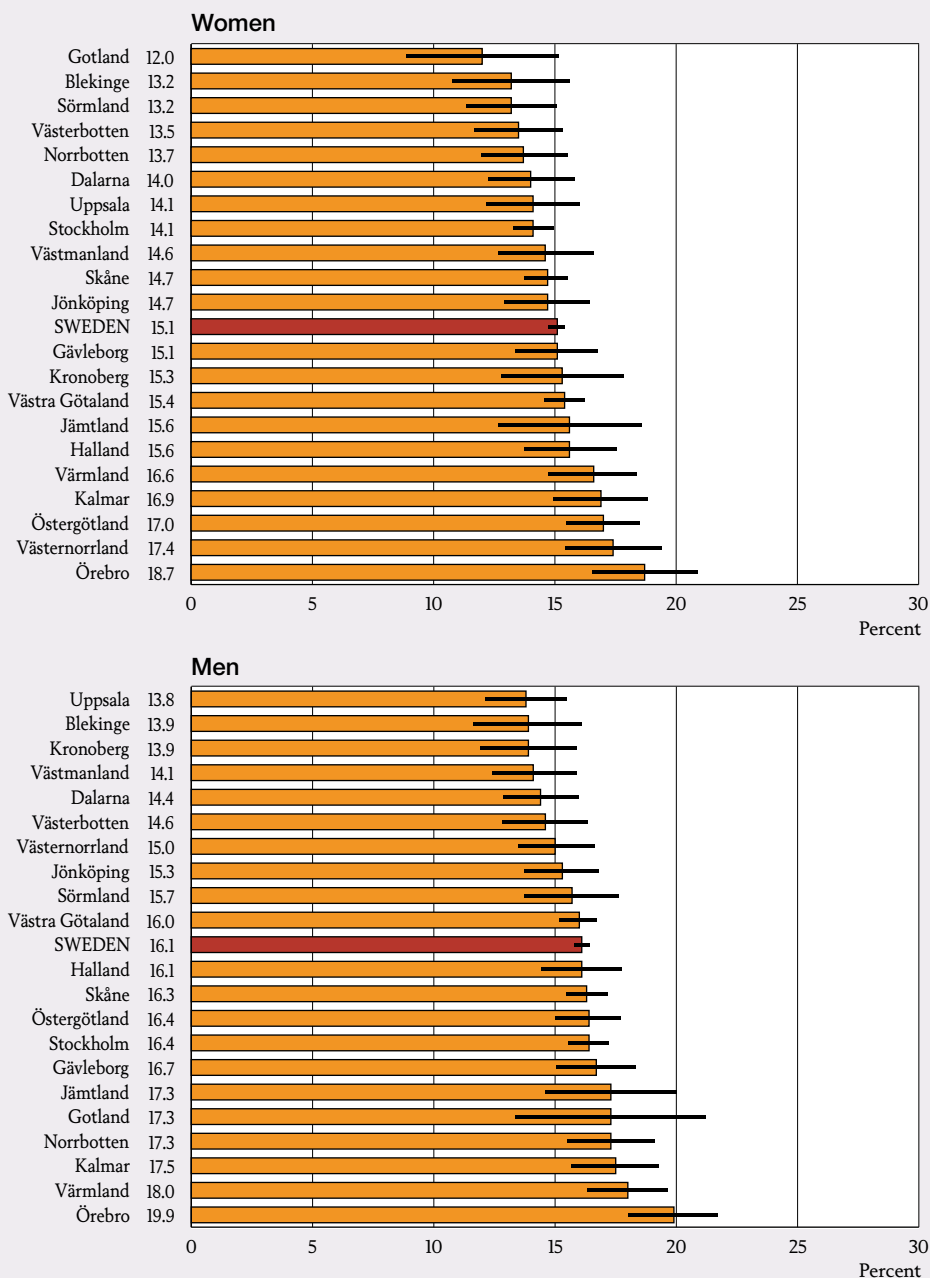


Figure A:32

Myocardial infarction – 28-day case fatality rate. First time myocardial infarction, hospitalised cases. 2002–2004. Percent. Age standardised.

Source: Patient Register and Cause of Death Register,
Centre for Epidemiology / The National Board of Health and Welfare

Reperfusion therapy for patients with ST-segment elevation myocardial infarction (A:33)

Acute coronary artery disease is classified as either ST-segment elevation myocardial infarction (STEMI) or unstable coronary artery disease. Non-ST-segment elevation myocardial infarction (NSTEMI) is included in the category of unstable coronary disease. Thirty percent of all patients treated at cardiac intensive care units (CICUs) are diagnosed with myocardial infarction. Approximately 40 percent are STEMI and 60 percent are NSTEMIs.

Because STEMI is the most serious myocardial infarction, the period from the onset of symptoms until the commencement of treatment is a critical factor. Prompt diagnosis and treatment have top priority. Thrombolysis was once the first-line therapy for STEMI. The use of primary percutaneous coronary intervention (PCI) has increased substantially over the past five years. Given that not all hospitals perform PCI, distance (time) is a factor when choosing a treatment strategy.

Based on data from RIKS-HIA, Figure A:33 shows the regional percentages of all patients with STEMI or left bundle branch block (LBBB) who were given acute reperfusion therapy. Reperfusion includes primary PCI, thrombolysis and – in a few cases – acute coronary artery bypass graft (CABG) surgery. The percentage for each method is presented. The data are for 2006. Nearly 5 200 patients are included.

The percentage of patients who received reperfusion therapy varied by region and gender. A number of regions, including Jönköping and Halland, showed large gender differences. Some regions were well over 80 percent, while a greater number were at 70 percent or below. The nationwide rate was just over 70 percent. That is higher than the previous ten years, when the rate was just over 60 percent.

A considerable proportion of patients, almost 30 percent, were diagnosed with myocardial infarction but received none of the therapies in question. The causes of what appears to be undertreatment have not been established. The distance to a hospital that performs PCI offers no explanation, given that thrombolysis therapy can be provided at any hospital with acute internal medicine units. The fact that some regions treat close to 90 percent of their patients suggests that substantial improvements are possible when it comes to hospital intervention.

The figure indicates that the percentage of patients who were given primary PCI varied significantly among the different regions. Use of the therapy has increased very rapidly in Sweden since 2003 but not as much in parts of the country where distances to hospitals pose an obstacle.

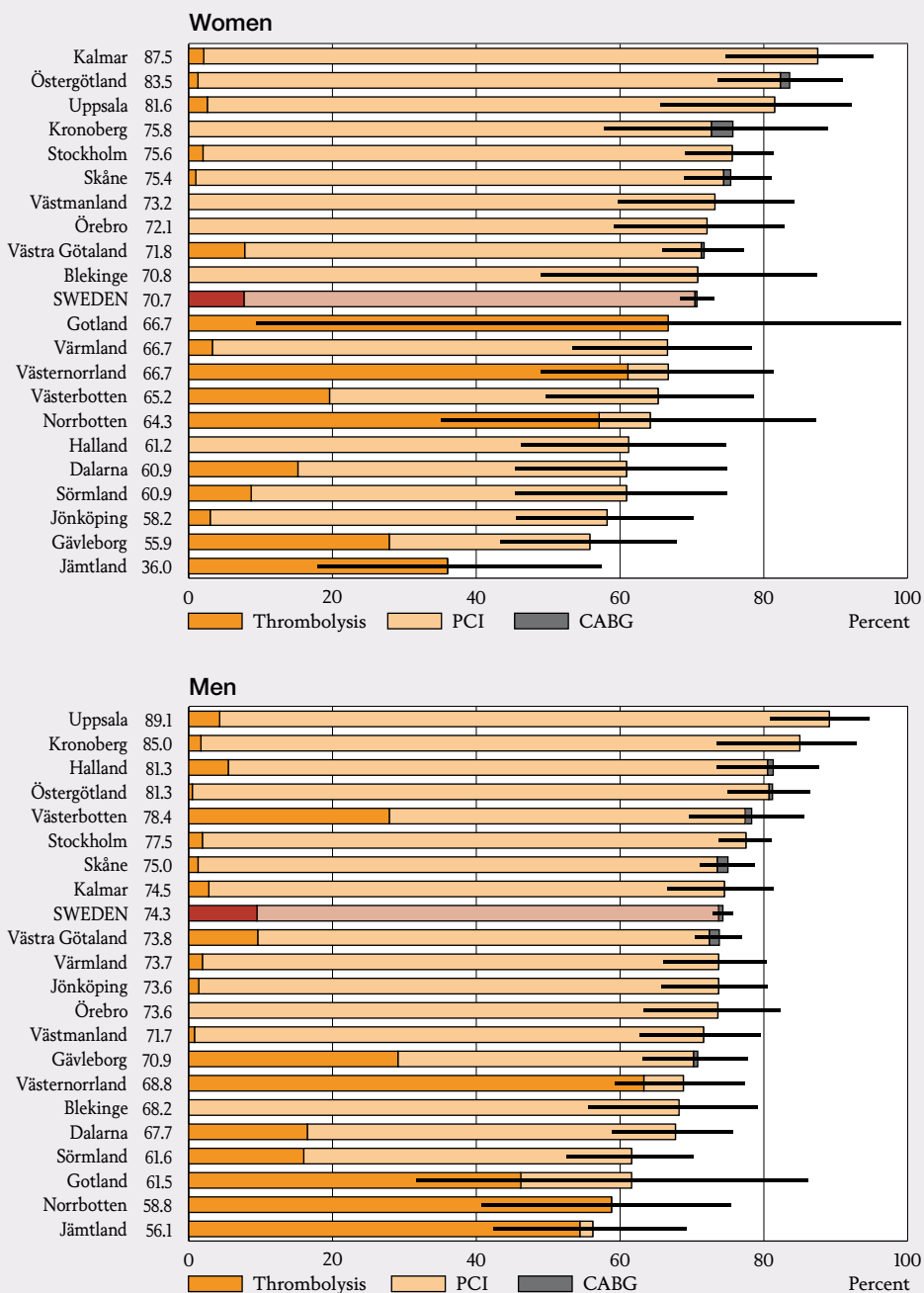


Figure A:33

Reperfusion therapy for patients with ST-segment elevation myocardial infarction. Patients younger than age 80. 2006. Percent.

Source: The Registry on Cardiac Intensive Care (RIKS-HIA)

The percentage of patients receiving reperfusion therapy also varied noticeably among different age groups. The rate was only 43 percent for people over 75. For younger age groups, the growing use of primary PCI significantly boosted the percentage of patients given reperfusion therapy over the past two years.

Data broken down by hospital

Figure A:33 Hospitals shows the percentage of patients receiving reperfusion therapy per hospital/clinic in 2006. Women and men are reported together, and the results are not broken down by the various reperfusion methods. The clinic breakdown follows that of RIKS-HIA.

RIKS-HIA's participation rate for hospitals and any differences in patient mix (age structure, varying incidence of disease, etc.) are relevant considerations when comparing hospitals with each other. Except for excluding patients age 80 and older, no attention has been paid to such considerations. Also worth noting are the wide confidence intervals.

Why so many patients are not treated has not been established. Given the large variations, the high priority that the therapy deserves, and the importance of prompt commencement of treatment and hospital-to-hospital collaboration for this group of patients, the great majority of hospitals appear to have substantial room to improve their procedures.

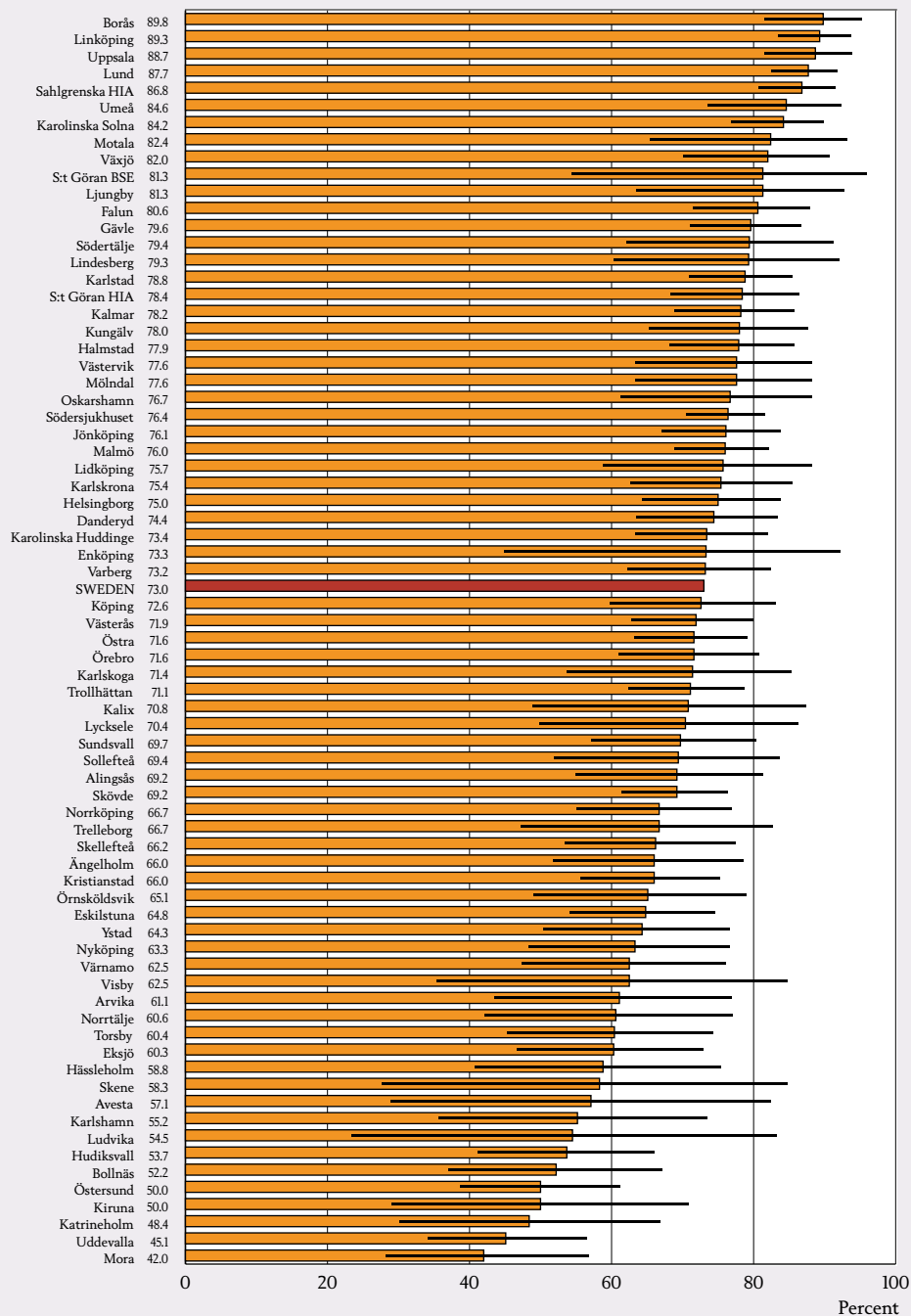


Figure A:33
Hospital

Reperfusion therapy for patients with ST-segment elevation myocardial infarction. Patients younger than age 80. 2006. Percent.

Source: The Registry on Cardiac Intensive Care (RIKS-HIA)

Coronary angiography for patients with non-ST-segment elevation myocardial infarction (A:34)

Early coronary angiography to determine whether to perform resvascularisation with PCI or bypass surgery within seven days can considerably improve the prognosis for patients with non-ST-segment elevation myocardial infarction (NSTEMI). According to the national guidelines, the therapy has top priority in patients with two or more of the following risk factors: older than 65, male, diabetes, previous myocardial infarction or other signs of serious lack of oxygen in the heart.

Figure A:34 shows the percentage of NSTEMI patients, reported separately for women and men, who received coronary angiography in 2006. All patients under age 80 were included. The total number of patients nationwide was 5 904. For women and men combined, more than 74 percent were given coronary angiography. Men averaged almost 77 percent nationwide, while women were just above 69 percent. The gender difference was very pronounced, above 15 percentage points, in a number of regions.

The percentage of patients given coronary angiography declined considerably with age, possibly due to contraindications in terms of concurrent diseases or conditions that rendered the examination unnecessary or unsuitable. Remarks by RIKS-HIA also suggest that there is some age discrimination with respect to this type of examination, which involves catheter-delivered coronary artery intervention or surgery. The less frequent use of coronary angiography in women may be due to their more advanced age or the fact that scientific studies have found poorer treatment results for women with the methods that may be recommended on the basis of the examination.

Regional comparisons show that Uppsala and Sörmland used coronary angiography the most. There was a rapid nationwide increase, while the regional differences narrowed during the year. Only Norrbotten and Gotland were below 60 percent.

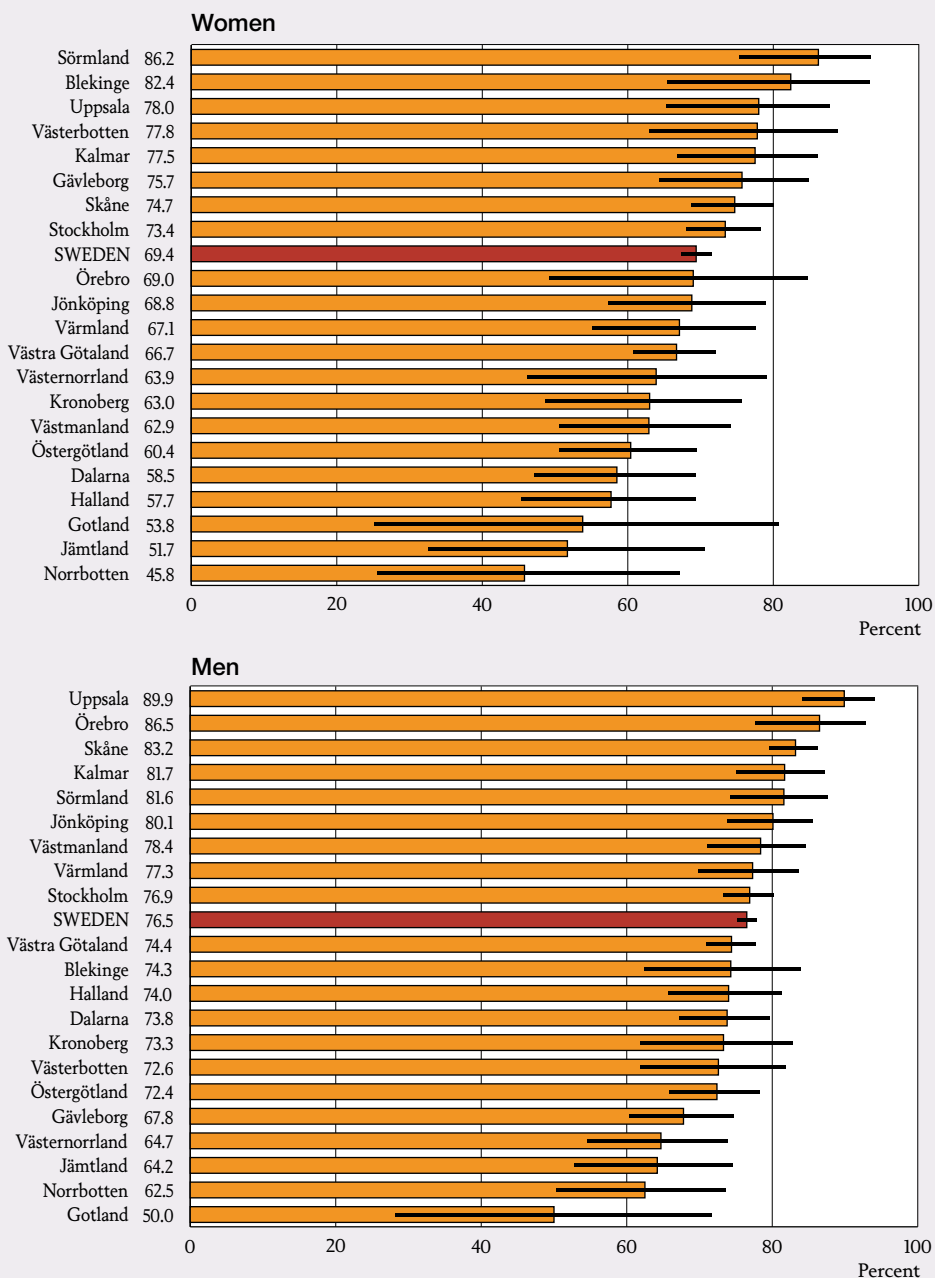


Figure A:34 Coronary angiography for patients with non-ST-segment elevation myocardial infarction. Patients younger than age 80. 2006. Percent.

Source: The Registry on Cardiac Intensive Care (RIKS-HIA)

Clopidogrel therapy after non-ST-segment elevation myocardial infarction (A:35)

Upon discharge from hospital, patients receive a number of drugs aimed at minimising the risk that myocardial infarction will recur. Acetylsalicylic acid (ASA or aspirin) therapy is well established. Adjunctive clopidogrel therapy further reduces the risk of recurrence. Clopidogrel is now recommended for all patients who have non-ST-segment elevation myocardial infarction (NSTEMI), with the exception of those who have been prescribed warfarin or who will soon be undergoing coronary artery bypass graft (CABG) surgery.

Figure A:35 shows the percentage of hospitalised NSTEMI patients who were given clopidogrel in 2006. The regional differences were relatively large, particularly for women – well over 20 percentage points at the extremes. The gender differences varied considerably and were large in regions such as Västernorrland and Östergötland.

There were also considerable age differences. Under age 65, 80 percent of women and 89 percent of men were given clopidogrel. For the 65–74 age group, 76 percent of women and 83 percent of men were given the drug. Among patients age 75 and older, 51 percent of women and 61 percent of men received the therapy. Thus, there were considerable age differences – among both women and men – for this therapy as well. In addition, the drug is used less for women than men.

An average 8 out of 10 patients under age 80 received clopidogrel therapy nationwide. Given that the therapy is recommended for essentially everyone in the patient group, that result points to undertreatment.

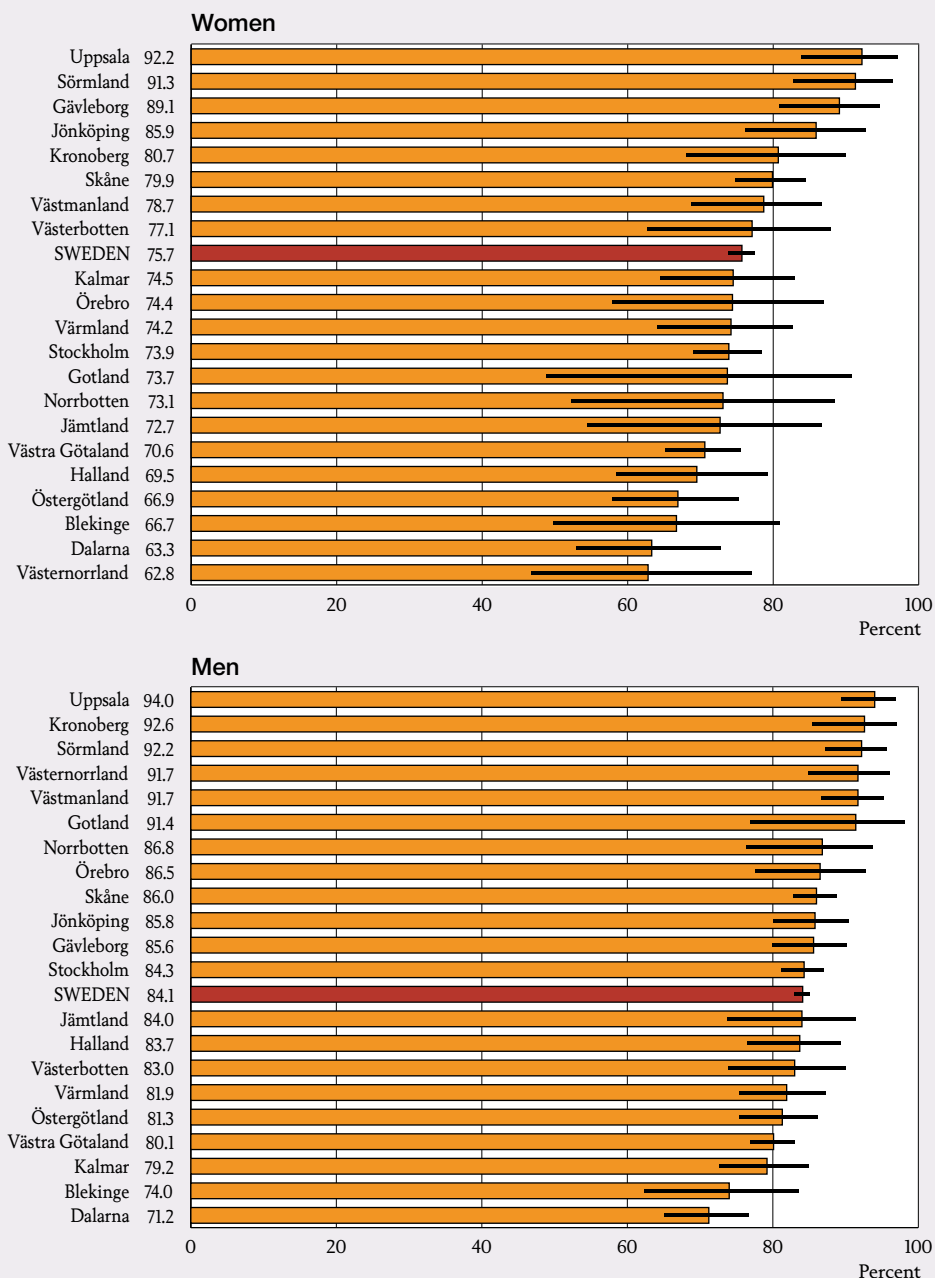


Figure A:35

Clopidogrel therapy after non-ST-segment elevation myocardial-infarction. Patients younger than age 80. 2006. Percent.

Source: The Registry on Cardiac Intensive Care (RIKS-HIA)

Waiting times for cardiac surgery (A:36)

Data on waiting times for treatment of the most common diseases in non-acute care are reported to the National Database on Waiting Lists and Waiting Times. A number of national healthcare quality registers also collect waiting time data. The presentation of this indicator is based on the premise that a long waiting time for cardiac surgery may entail a medical risk.

Waiting time is the period from the date on which surgery is ordered until it is performed. Median waiting time is the most suitable measure. Some patients receive acute surgery within 24 hours, while others wait longer – for instance, an organ may not be available for transplant or the patient may wish to postpone the procedure.

The data are taken from the Swedish Heart Surgery Registry for 2006. The participation rate is excellent, close to 100 percent. Women and men are reported separately. A total of 7 600 operations are included. Only a few regions have hospitals that perform open heart surgery. The statistics presented here concern how long patients from each region waited regardless of where the surgery was performed.

Figure A:36 shows median waiting times in number of days. The median waiting time is 29 days for women and 22 days for men nationwide. There were significant regional differences for both women and men. The median nationwide waiting time did not change noticeably from 2003 to 2006.

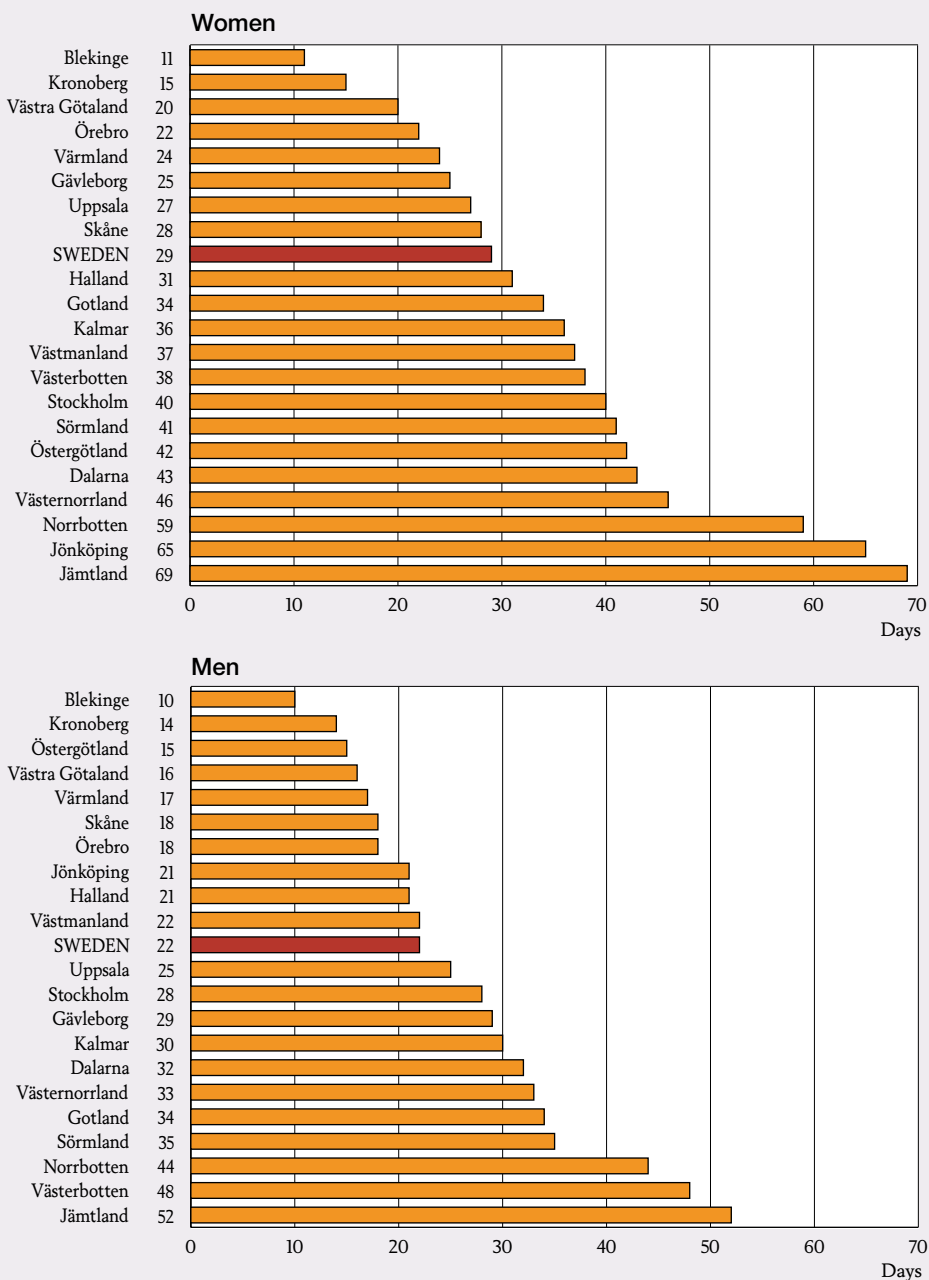


Figure A:36

Cardiac surgery – median waiting time, days. 2006.

Source: Swedish Heart Surgery Registry

Lipid lowering drug therapy after myocardial infarction (A:37)

As is the case with stroke, elevated blood pressure and lipid levels after myocardial infarction are key risk factors for recurrence of cardiovascular disease. While a proper diet and lifestyle are integral to treatment, a considerable percentage of myocardial infarction patients need lipid lowering drug therapy. Statins lower lipid levels and thereby reduce the risk of new coronary artery stenosis. The therapy has high priority in the national guidelines.

RIKS-HIA collects data about the extent to which patients are prescribed statins when discharged from hospital. This indicator presents instead the percentage of myocardial infarction patients who pick up statin prescriptions during a certain period of time after hospitalisation. For that purpose, data from the Patient Register and Prescribed Drug Register have been combined. The results cover 25 000 patients younger than 80 who were hospitalised for myocardial infarction in 2005 and 2006.

Figure A:37 shows the percentage of women and men who were treated with statins after myocardial infarction. The nationwide result was above 80 percent, though almost 5 percentage points higher for men. According to an assessment based on data from RIKS-HIA concerning the percentage of the patient group that had elevated lipid levels, approximately 80 percent should have been treated. Thus, undertreatment does not appear to be an issue at the national level. A few regions had lower percentages, but only Gotland deviated significantly.

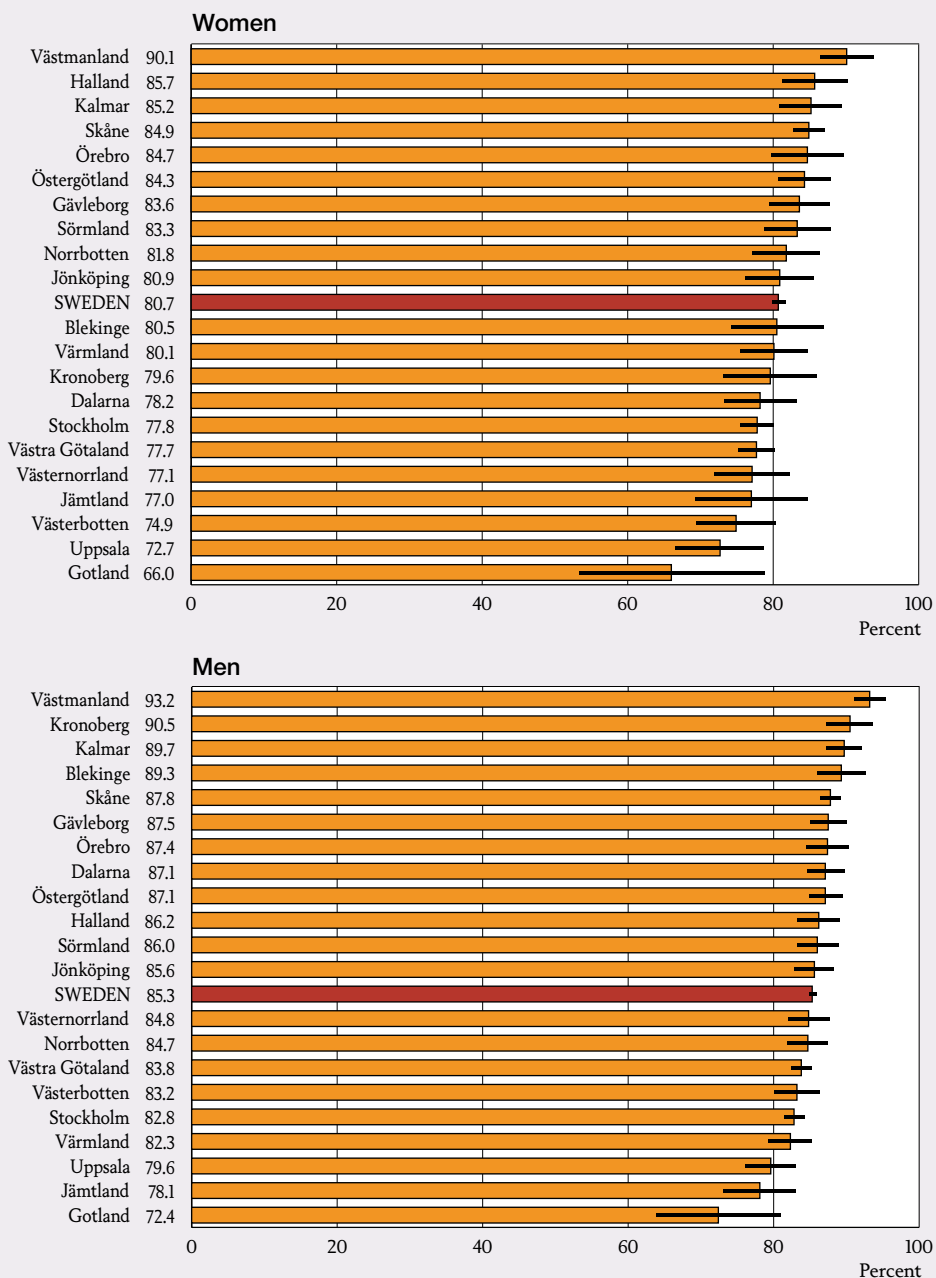


Figure A:37 Lipid lowering drug therapy after myocardial infarction. Jan-June 2007. Percent.

Source: Patient Register and Swedish Prescribed Drug Register,
Centre for Epidemiology / The National Board of Health and Welfare

ORTHOPAEDIC CARE

The seven orthopaedic indicators concern diseases and treatment methods – knee arthroplasty, hip replacement arthroplasty and hip fracture – that are common and entail high social costs. All the indicators are well established and based on data from the national healthcare quality register for the disease or treatment method involved.

Total knee arthroplasty – revisions within one year due to infection (A:38)

Osteoarthritis of the knee is uncommon in people younger than 50, and the incidence rises with age. Women, especially the elderly, require treatment for osteoarthritis of the knee a good deal more often than men. According to the Patient Register, knee arthroplasty was performed more than 10 000 times in Sweden during the course of 2006. Women accounted for 6 000 of the total.

The data presented below are taken from the Swedish Knee Arthroplasty Register. They refer to all total knee arthroplasty procedures performed in 1996–2005 on osteoarthritis patients.

Almost 55 000 operations were performed. The register contains data for hospitals and clinics from every region. Clinics are reported under the region in which they are located regardless of where their patients live. While regional participation rates are not reported, a comparison with the Patient Register for 1998–2002 suggested that they were favourable.

The compilation has not been adjusted for variations in region-specific revision or infection risk, or in the number of patients. General interpretation difficulties related to this simplification were previously discussed in connection with geographic comparisons.

Infection during the procedure is a serious complication that can lead to amputation or fusion surgery (arthrodesis). This indicator concerns the number of revisions due to infection that were performed within one year after total knee arthroplasty. Revision refers to reoperation during which a prosthesis component is removed, added or replaced. Infections treated without revision are not entered in the register.

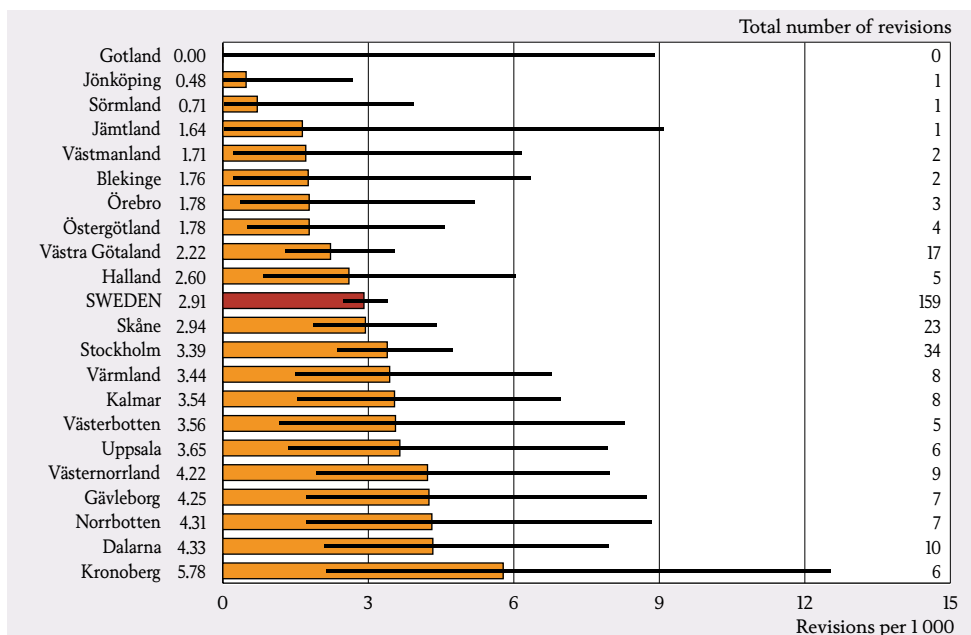


Figure A:38 Total knee arthroplasty – revisions within one year due to infection, per 1 000 patients. 1996–2005.

Source: Swedish Knee Athroplasty Register

Figure A:38 shows the number of revisions per 1 000 operations, as well as the actual number of revisions by region. The nationwide rate was 2.9 revisions per 1 000 operations. While the regional variations were significant, the number of revisions was strikingly low on the whole. Kronoberg’s rate of 5.8 was relatively high but represented only 6 actual revisions in 1996–2005. Nationwide, there were 159 revisions out of just under 55 000 operations.

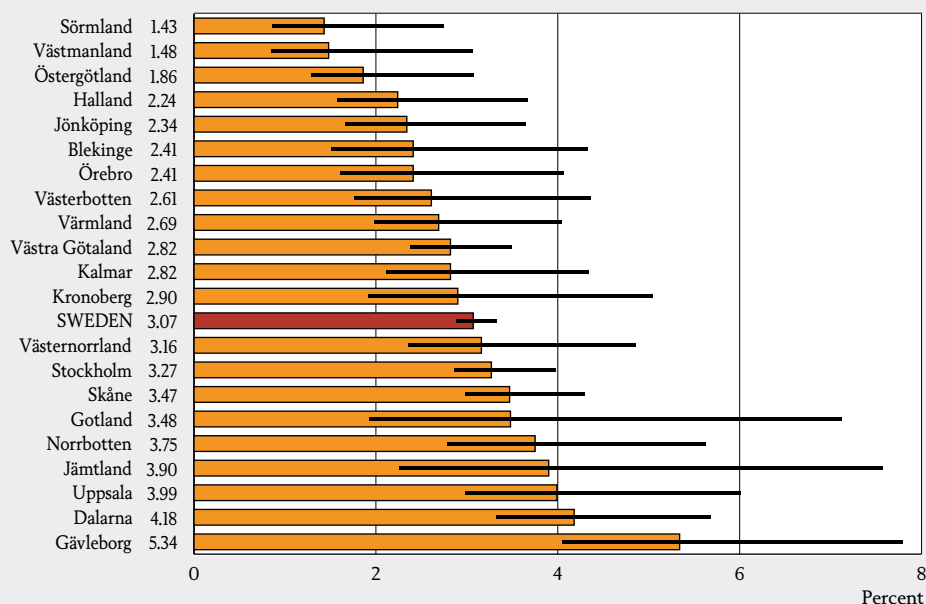


Figure A:39 Total knee arthroplasty – five-year risk of revision. 1996–2005. Percent.

Source: Swedish Knee Arthroplasty Register

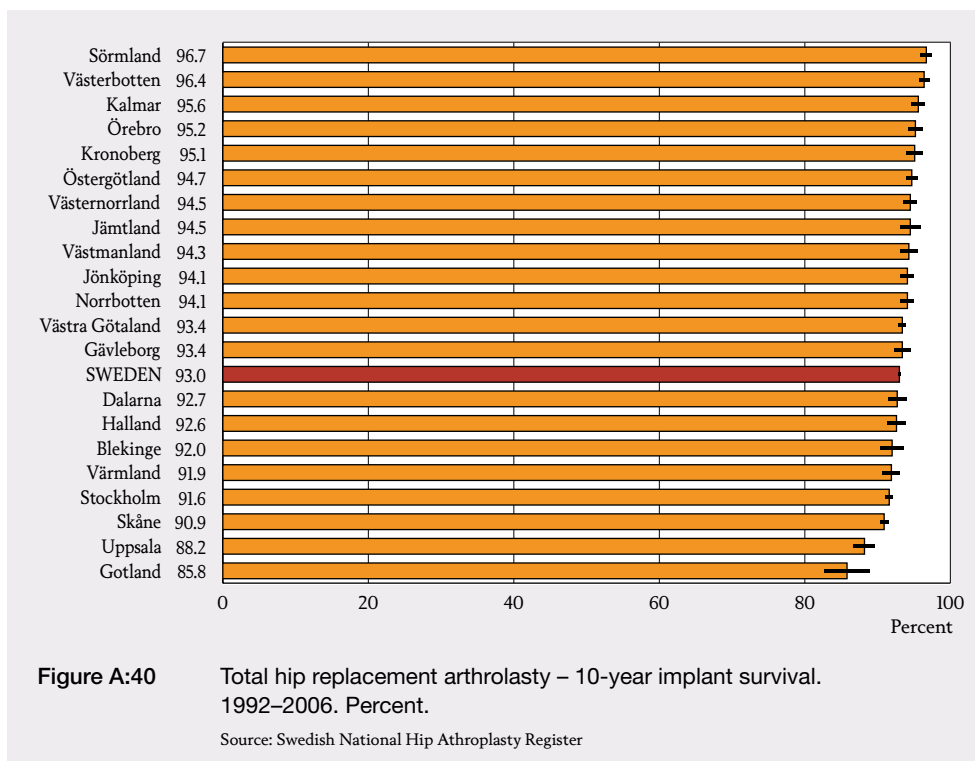
Knee arthroplasty – five-year risk of revision (A:39)

A:39 shows the five-year risk of revision, regardless of cause. This is also a clear outcome measure. The nationwide risk for revision within five years was 3.1 percent. The rate ranged from below 1.5 percent in Sörmland and Västmanland to 4–5 percent in Dalarna and Gävleborg. Gender differences were marginal, considerably smaller than regional differences.

Total hip replacement arthroplasty – 10-year implant survival (A:40)

Primary total hip replacement arthroplasty was performed almost 14 000 times in 2005. In addition, there were almost 2 000 reoperations. More women than men underwent surgery.

All relevant Swedish clinics reported data concerning primary total hip replacement arthroplasty to the Swedish National Hip Arthroplasty Register. Their participation rate was 100 percent for the indicators of implant survival and reoperation presented here. Between 95 and 98 percent of all reoperations were reported. The participation rate has been increasing for patient-reported outcomes, and 70 of 77 clinics submitted data.



The results for individual hospitals are published in the register’s annual report, as well as on its website from now on. Eight indicators have been selected for public presentation.

Implant survival after surgery is a key quality measure. Surgery is regarded as having failed if a prosthesis component must be replaced or the entire implant removed. The Swedish National Hip Arthroplasty Register has long monitored results with this quality indicator. The data here cover the almost 170 000 operations performed in 1992–2006.

According to the register, Sweden has had the world’s lowest frequency of reoperations to replace prosthesis components for a number of years.

The regional comparison includes all patients, who represent a wide range of risk factors and types of hospitals. The location of a clinic, not where the patient comes from, forms the basis of the regional data. Clinics collaborate to make sure that severe cases are sent to those with special expertise. Those clinics operate on patients who face greater surgical risks and thereby a higher frequency of complications. Interregional referrals may affect results. No correction has been made for that possibility here.

Figure A:40 shows 10-year implant survival after total hip replacement arthroplasty in 1992–2006. The nationwide survival rate was 93 percent. The rate was 94 percent for women and 91 percent for men (the data are not broken down by gender here). Survival rates ranged from less than 90 percent in Gotland and Uppsala to better than 96 percent in Sörmland and Västerbotten.

The results for Uppsala should be interpreted in light of its patient mix. Uppsala University Hospital, which plays such a dominant role there, is a regional institution and thereby likely to operate on a larger percentage of patients who face surgical risks.

Total hip replacement arthroplasty – reoperation within 2 years (A:41)

Ten-year implant survival is a vital quality variable but also a slow follow-up indicator. The need also exists for indicators that can provide rapid feedback to clinics and support their improvement efforts without inordinate delay.

One faster indicator concerns the percentage of reoperations within two years of initial surgery regardless of the cause. The short follow-up time primarily reflects

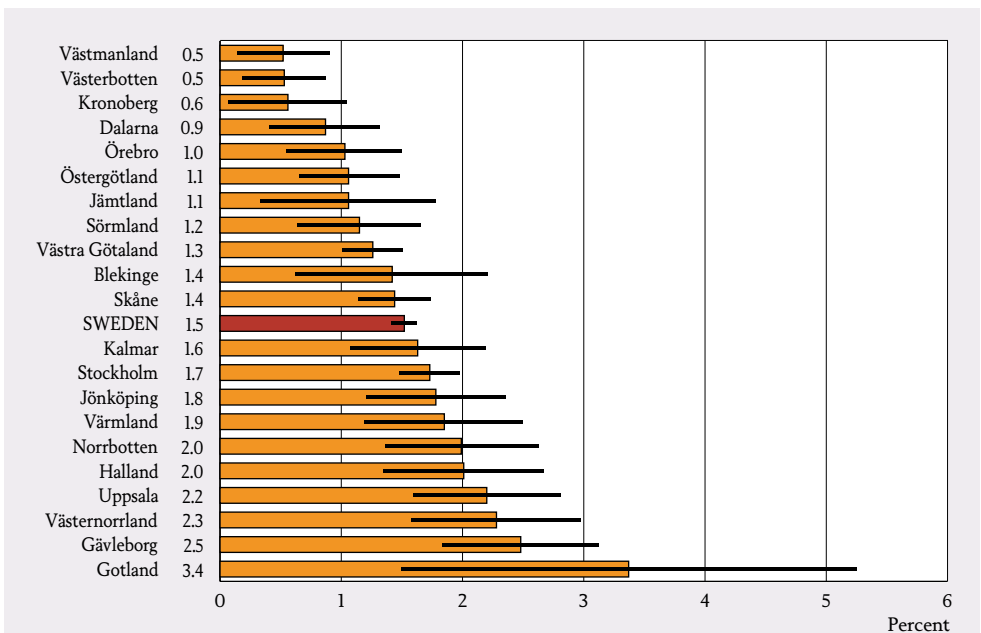


Figure A:41 Total hip replacement arthroplasty – reoperation within 2 years. 2003–2006. Percent.

Source: Swedish National Hip Arthroplasty Register

early and serious postoperative complications, such as deep infection and revision due to repeated dislocation of the hip prosthesis.

The percentage of reoperations presented in Figure A:41 is based on the almost 54 000 initial procedures performed in 2003–2006. Only surgically treated complications are included. The register does not capture infections treated with antibiotics or conservatively treated total dislocations (luxations). If a patient is repeatedly reoperated on for the same complication, only a single complication is reported. Data for patients reoperated on at a clinic other than the primary one are assigned to the primary clinic.

The frequency of complications was generally low, and random variations had a large impact on the results. The comparison should be interpreted with caution and the same reservations specified for indicator A:40. The results, i.e., whether there are any clear trends, can only be evaluated over time.

A total of 1.5 percent of all patients nationwide had reoperations within two years. That represents just over 800 patients. Three regions had reoperation rates of approximately 0.5 percent. Only 7 out of 1 347 patients were reoperated on in Västmanland during the period. Four regions had reoperation rates above 2 percent. One of them was Uppsala, whose patient mix is discussed above.

Total hip replacement arthroplasty – patient-reported outcome (A:42)

The Swedish National Hip Arthroplasty Register follows up on the patient-reported outcome of surgery. One of the measures is the EQ-5D instrument, which generates a weighted total index score for health-related quality of life. The poorest score is -0.594, while the highest score is 1.0.

The patient-reported outcome in terms of satisfaction, pain relief and health gain is important in this group of patients, for whom pain and poor quality of life are the surgical indications. All patients fill out a 10-question preoperative form. The same form, with an additional question concerning satisfaction, is sent to the patient a year later. The procedure, including a radiological examination, is repeated at six and ten years.

Last year the register presented results for seven regions. This year the register is able to report the results of 14 regions for over 12 500 patients who were followed up on in 2003–2006. Figure A:42 shows the change (improvement) in health-related quality of life (EQ-5D) at 1-year follow-up after surgery.

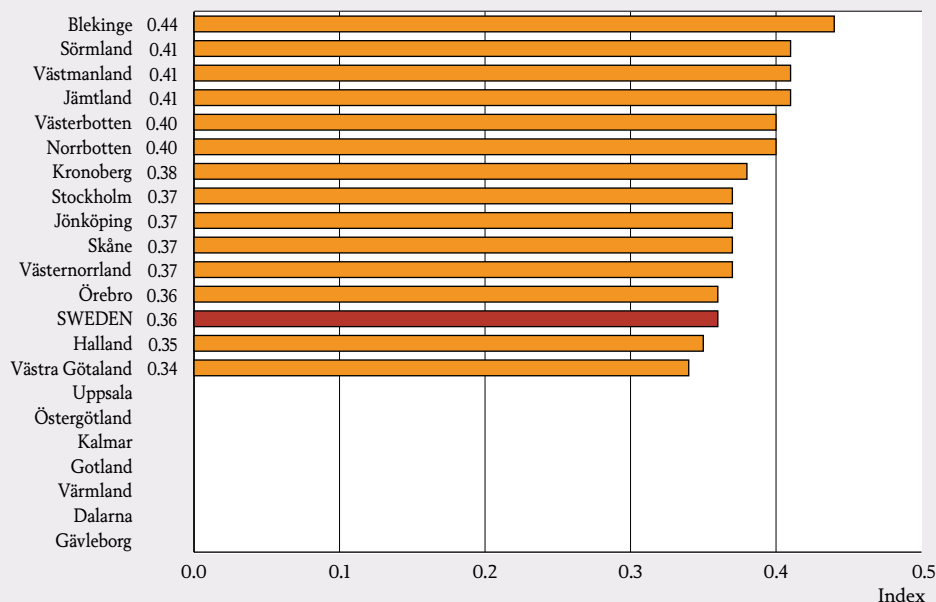


Figure A:42 Total hip replacement arthroplasty – patient-reported outcome. Improvement in EQ5D after one year. 2003–2006.

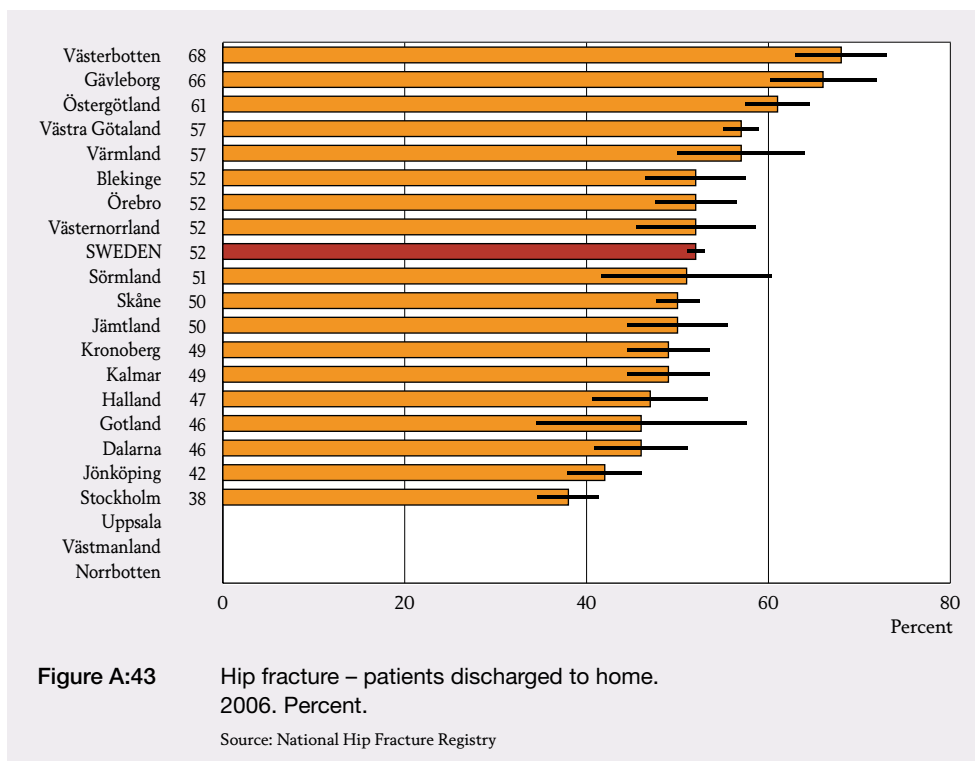
Source: Swedish National Hip Athroplasty Register

Given that there were quite a few regions in which only a limited number of patients were followed up on, the results must be interpreted with a large degree of caution. The nationwide score is below most of the regional scores because Västra Götaland, whose score was low, accounted for approximately half of all patients who were followed up on.

A key motivation for publishing the comparison in this report even though many regions (clinics) are not included is to stress the importance of self-reported outcome in this type of presentation. Stockholm clinics have a particularly low participation rate. The register has set the goal of full nationwide participation in 2008.

Hip fracture – patients discharged to home (A:43)

Approximately 18 000 Swedes fracture their hips every year. Women do so more often than men. The mean age is strikingly high, around 80. Many hip fracture patients have concurrent diseases and consume substantial resources in different parts of the healthcare and social service systems. A significant percentage die within a year after the fracture.



The National Hip Fracture Registry (RIKSHÖFT) reports extensive data about this patient group each year. The hospitals covered have a good participation rate for their cases, but not all hospitals and clinics are involved. Just over 10 000 cases were reported in 2006 out of approximately 18 000 hip fractures. There are regional differences in the participation rate, but more details are lacking. Thus, regional comparisons must be interpreted with great caution.

The data below are for 2006. No information is available for three regions. Data per hospital are aggregated to the regional level regardless of where the patients come from. That is of little importance given that hip fracture is an acute injury and referrals to other regions are negligible.

A key outcome measure is the percentage of patients who are discharged home after surgery and a hospital stay. Discharge home suggests that the patient's functioning has been restored, or at least has not deteriorated to the extent that she/he needs to move to a facility that provides additional care. Thus, a high percentage for this indicator is desirable.

Figure A:43 shows the percentage of patients who were discharged home from acute care hospitals. The nationwide rate was 52 percent. The spread between the two regions at the top of the figure and the two regions at the bottom was relatively large.

One thing to keep in mind when drawing any conclusions from the data is that collaboration between acute clinics and geriatric or rehabilitation clinics can have a negative impact on the reported results. A patient discharged from an orthopaedic clinic to a rehabilitation clinic for a short time is not reported as having been discharged home. The low percentage for a region such as Stockholm should be interpreted in light of that consideration.

Data taken from the register point to a correlation between average period of care and the percentage of patients discharged home. Shorter average periods of care appear to translate into a lower percentage of patients discharged home, and vice versa.

Hip fracture – waiting time for surgery (A:44)

All hip fracture patients are taken to an acute hospital and operated on, although the type of surgery varies. Because the actual fracture is not acutely life threatening, there may be a waiting time for surgery. The delay ordinarily leads to a longer

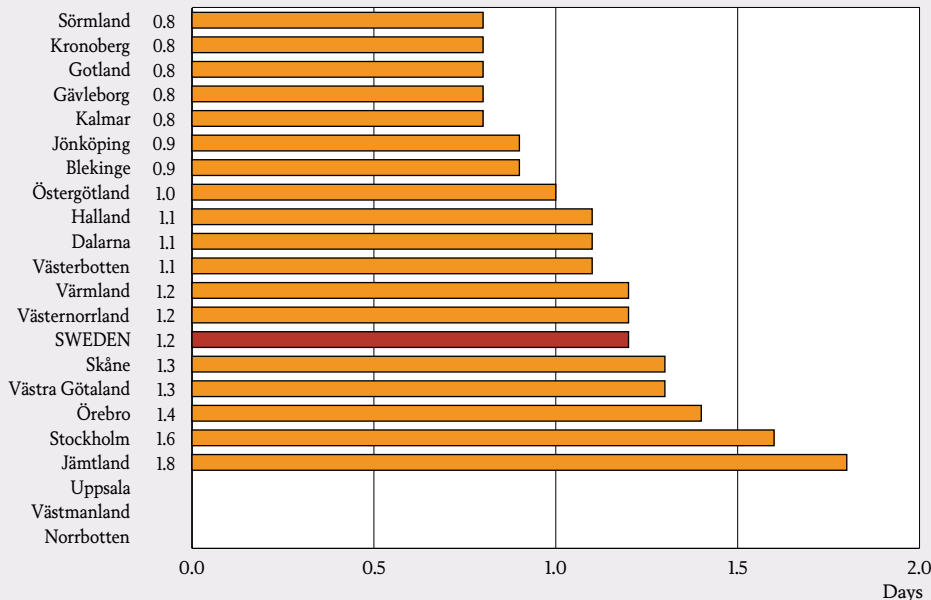


Figure A:44 Hip fracture – mean waiting time for surgery.
Days. 2006.

Source: National Hip Fracture Registry

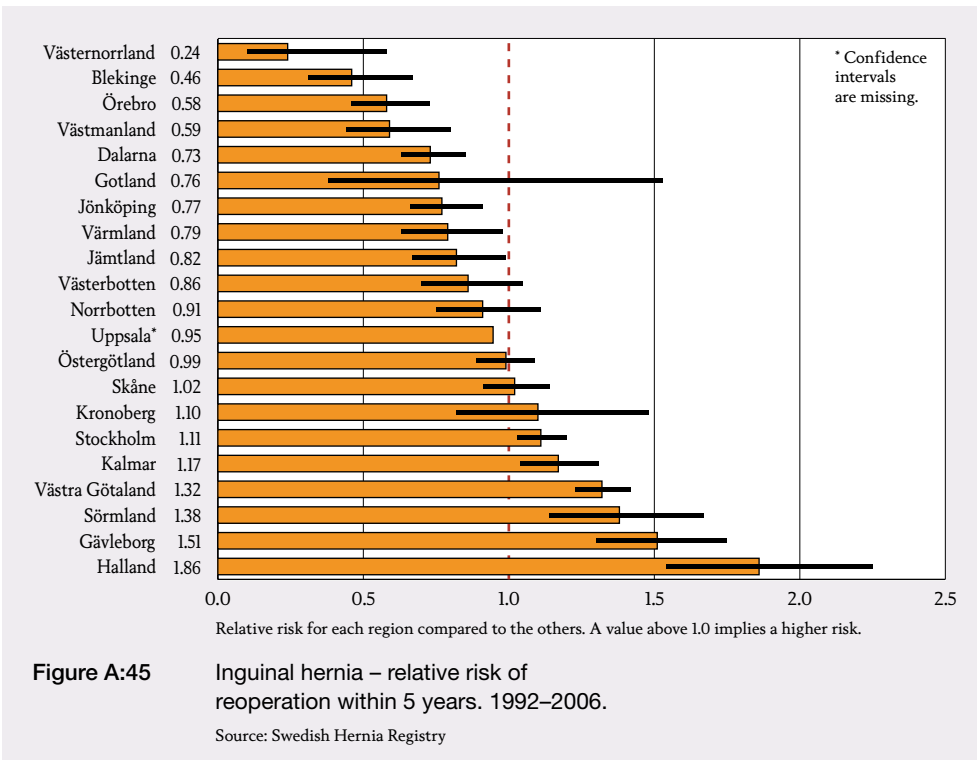
mobilisation period for patients. The risk of bedsores, infections and other complications increases. Thus, the time between arrival at hospital and the start of surgery is a frequent international quality measure.

RIKSHÖFT measures the average waiting time in days for all hip fracture patients. Figure A:44 shows that the average nationwide waiting time was 1.2 days. One group of regions averaged 0.8 days, while three regions averaged close to or more than 1.5 days. RIKSHÖFT now measures average waiting time from arrival at the emergency room until the start of surgery in hours instead of days. That will permit more sophisticated descriptions and analyses of waiting times and the course of treatment.

OTHER TREATMENTS

Inguinal hernia – relative risk of reoperation within 5 years (A:45)

Inguinal hernia surgery is the most common general surgical procedure in Sweden. Almost 20 000 procedures are performed every year. Successful surgery is uncomplicated, requiring approximately one week of absence from work, followed by freedom from complaints. But inguinal hernia surgery can lead to recurrence of the hernia and severe chronic pain conditions. There was a time when close to 20 per-



cent of all operated patients had a recurrence of hernia. Current surgical methods and materials have sharply reduced the recurrence rate.

This indicator reflects the relative risk of reoperation per region. Relative risk measures the risk of reoperation following surgery at hospitals in a region compared with the risk at hospitals in the other regions.

The source of the data is the Swedish Hernia Registry, which publishes quality data on its website. The register's participation rate is excellent. Approximately 95 percent of all operations are reported nationwide. The comparison is based on data in the register until 2006. The location of the clinic, not the patient's region of domicile, determines how an operation is classified.

Figure A:45 demonstrates significant regional differences. Västernorrland has the lowest relative risk, followed by Blekinge. Gävleborg, and above all Halland, are at the bottom of the figure. The differences among regions and clinics indicate that Swedish inguinal hernia surgery still has considerably potential for improvement.

Cataract surgery, visual acuity below 0.5 in the better seeing eye (A:46)

Approximately 72 000 cataract operations were performed in 2006. The eyesight of a large percentage of the patients improved considerably. For a number of years, the Swedish National Cataract Register has contained extensive data about this procedure and the results for patients. The register has an excellent participation rate.

Data about visual acuity in the better seeing eye are recorded at the time of surgery. That is a measure of the availability of cataract surgery in the various regions. If a large percentage of the population is operated on for a number of years, the patients offered an operation the actual year will see comparatively better prior to surgery. More operations on the other eye are also improving the results.

Figure A:46 shows the percentage of all operated patients who had visual acuity under 0.5 dioptres in the better seeing eye. The data are for 2006. Women and men are reported separately. The regional data are based on where the patient comes from regardless of where surgery was performed.

A position high in the figure indicates that availability is good, given that the operated patients had comparably better vision (less severe visual defects) in the better seeing eye. Some of the regions, such as Blekinge and Stockholm, at the top of the figure were also high in 2005. Värmland was lower than 2005, while Västmanland improved. The largest percentage of patients with major visual defects were in Östergötland, Jämtland and Örebro.

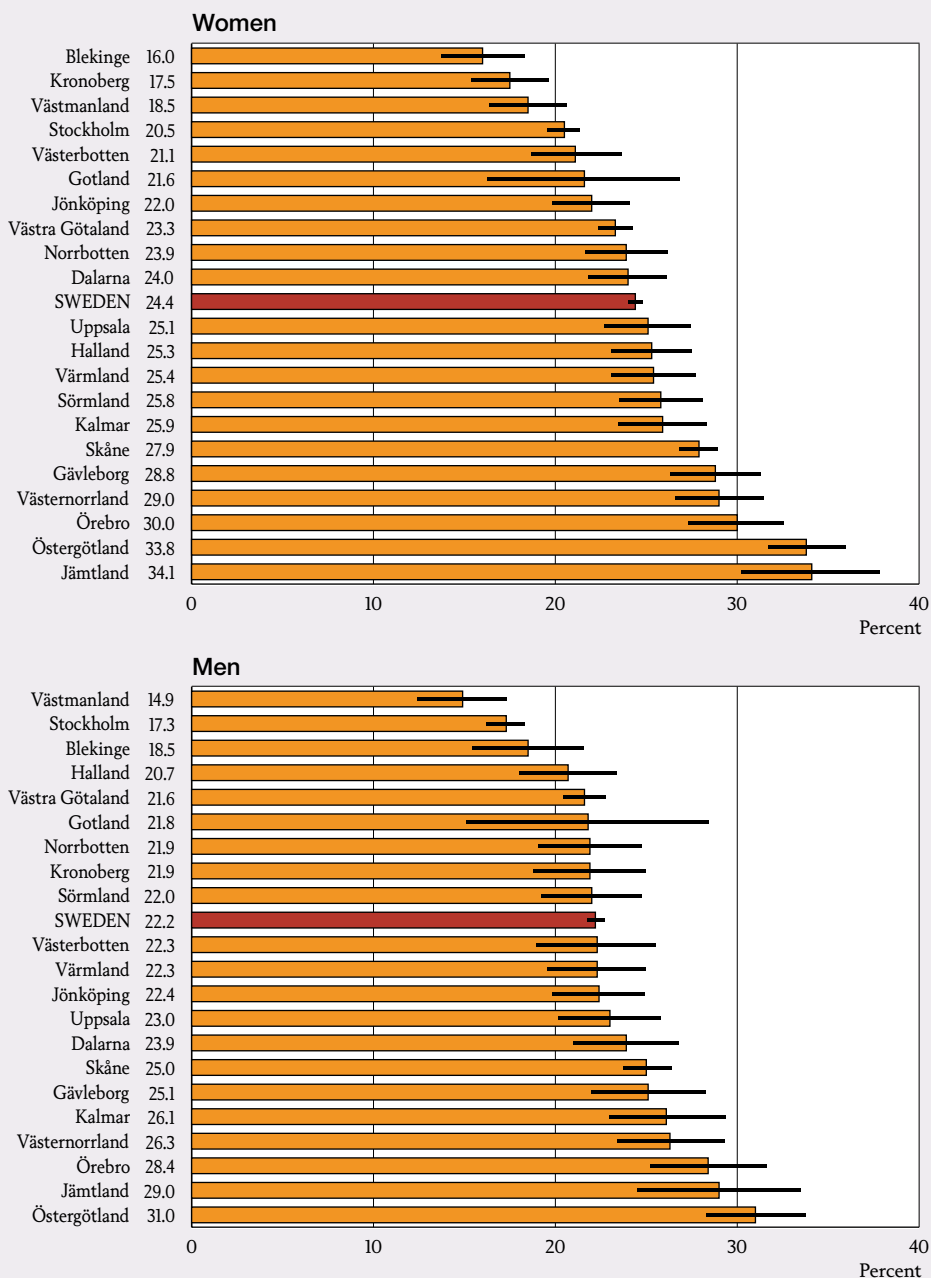


Figure A:46

Cataract surgery – visual acuity below 0.5
in the better seeing eye. 2006. Percent.

Source: Swedish National Cataract Register

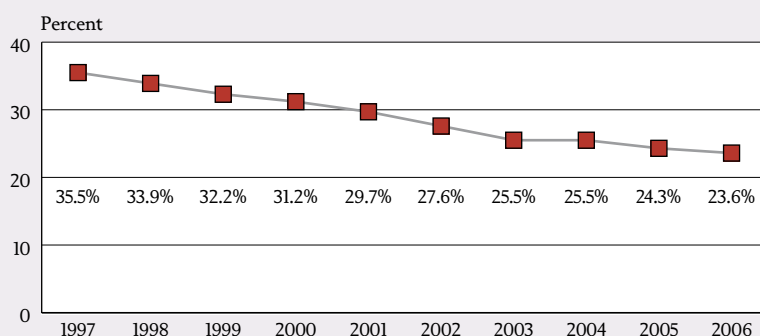


Figure A:46 Cataract surgery – visual acuity below 0.5 in the better seeing eye. 2006. Percent.

Sweden

Source: Swedish National Cataract Register

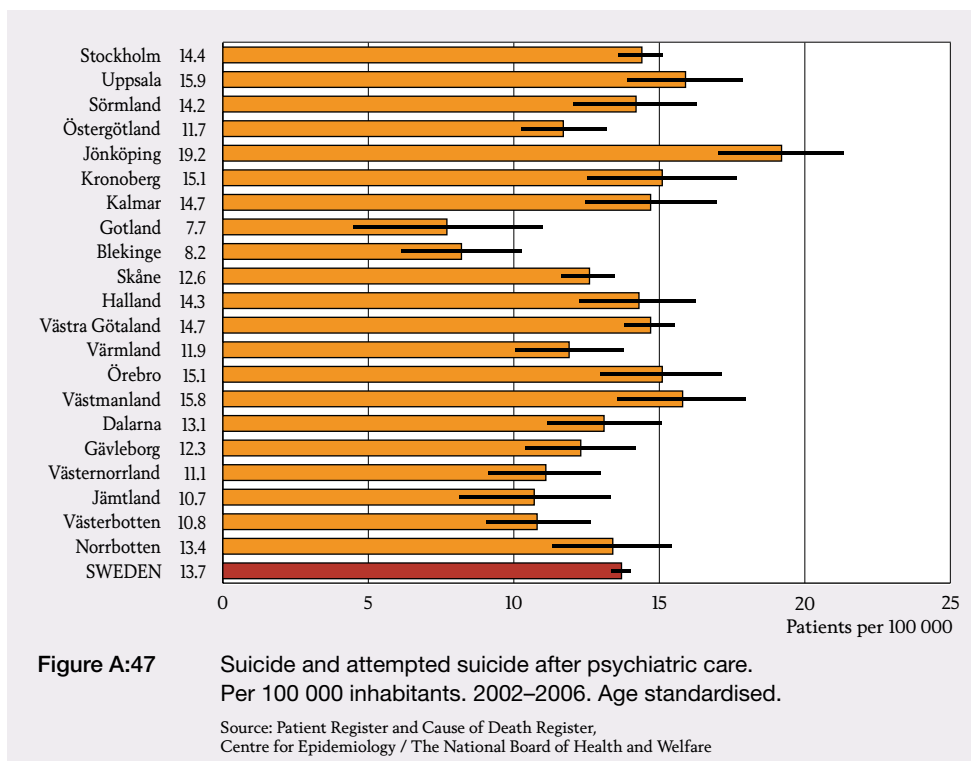
There were gender differences worthy of discussion. Women generally had poorer vision at the time of surgery than men. The largest gender differences in 2006 were in Jämtland and Halland. But men in Kronoberg and Blekinge had poorer vision than women at the time of surgery. Interpretation of the gender differences is rendered more difficult by variations in other variables – such as age, surgery on the other eye and driving licence – among operated women and men. Statistical uncertainty may also play a role.

The regional differences have been of the same magnitude for many years. As part of Sweden's healthcare guarantee programme, joint indicators have been developed for when cataract surgery should be performed. The regional differences may narrow as a result. No such dynamic was clearly at work in 2006.

The long-term nationwide trend (see Figure A:46 Nationwide) shows that patients have better and better vision at the time of surgery. While that is good news for this patient group, it raises the question of how their needs should be prioritised in relation to other patient groups. Are the regions at the top of the figure operating on patients who are too healthy, or should the regions at the bottom of the figure operate on more patients with better relative vision? The cost per operation, which is comparatively low, is also of relevance.

Suicide and attempted suicide after psychiatric care (A:47)

The number of Swedes who commit suicide has declined since the early 1980s. Sweden and northern Europe in general have medium suicide rates compared with Europe as a whole, although Denmark and Finland have higher rates. A total of 1 154 Swedes committed suicide in 2004, while more than 200 other deaths were deemed



to have undetermined intent. Many of the people who committed suicide had a recent psychiatric appointment. In addition, approximately 8 000 people made one or more suicide attempts.

A directive took effect on 1 February 2006 that specifies the duty pursuant to Sweden's Lex Maria system to report suicides committed within a month of the victim's last contact with the healthcare system. After investigating 150 of the reported cases, the NBHW found shortcomings in half of them with regard to suicide risk assessment, documentation, competence, treatment programmes, monitoring and supervision.

This comparison covers suicide and attempted suicide within 90 days after discharge from inpatient psychiatric care. Only attempted suicide that led to inpatient care is included. Regional differences when it comes to indications for inpatient care may have affected the results. Regions that use inpatient care more often will report more suicides or attempted suicides by people who have recently been discharged from inpatient psychiatric care. Thus, a reasonable assumption is that people will have been admitted more often within 90 days prior to suicide or attempted suicide. Given that we include only attempted suicide that led to inpatient care, regional

differences in admission criteria may affect the number of cases. Such differences may help explain high rates.

Figure A:47 shows that an average of 13.7 per 100 000 inhabitants nationwide committed or attempted suicide each year within 90 days after discharge from inpatient psychiatric care. That represented approximately one sixth of all suicides or attempted suicides. While the reported regional variation was relatively large, other factors than the quality of healthcare may have been involved. With only a few exceptions, the ratio of suicides and attempted suicides to the total number of patients in inpatient psychiatric care was similar from region to region. Halland had the highest percentage in terms of that comparison.

One possible interpretation of a high value for this indicator is that well-functioning psychiatric care is successfully identifying patients with suicidal tendencies but that continuing care after discharge from an inpatient facility suffers from certain shortcomings.

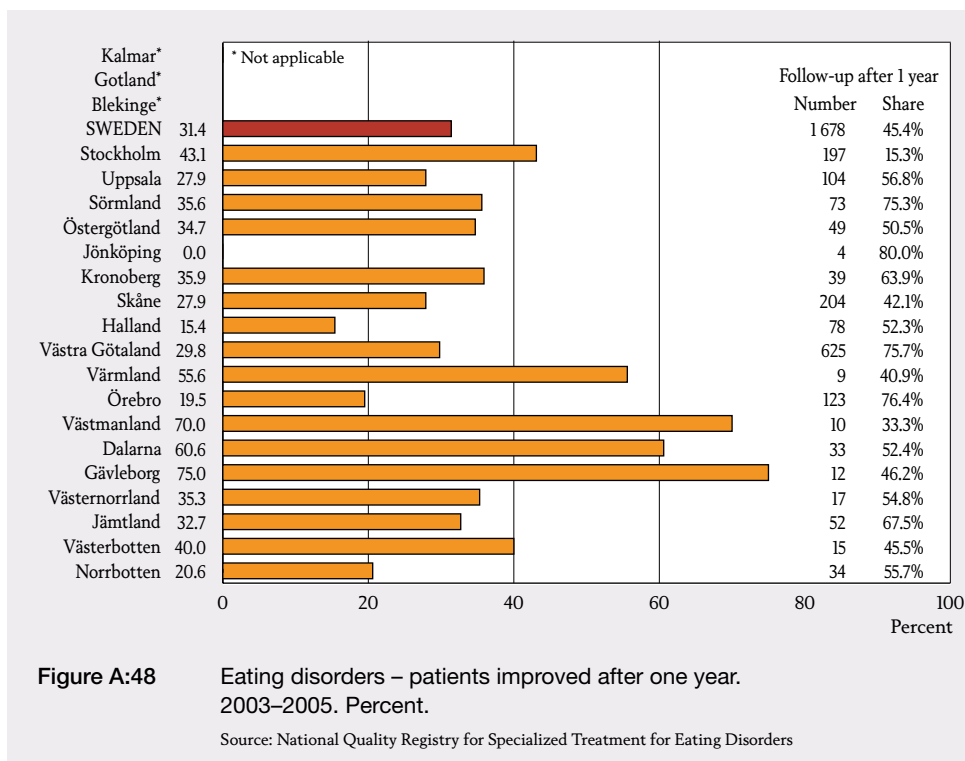
Given the abovementioned uncertainties when it comes to interpreting the results, we have not ranked the regions. But the percentages of suicides and attempted suicides following psychiatric care point to key areas that can be addressed by improvement efforts in every region.

Eating disorders – treatment results after one year (A:48)

Eating disorders usually begin in adolescence and frequently lead to recurring care episodes for a long time. At any point in time, approximately 1.5 percent of adolescent girls and young women have anorexia nervosa (AN) or Bulimia nervosa (BN). Eating Disorder Not Otherwise Specified (EDNOS) is 3–4 times more common than AN and BN. Between 75 000 and 100 000 Swedish adolescent girls and young women may have some form of eating disorder. The percentage of all people with eating disorders who receive treatment through child and adolescent psychiatry, general psychiatry or specialised eating disorder care is unknown but appears to be relatively small (less than one third).

An eating disorder causes great suffering for the victim and is associated with substantially higher mortality rates than most other psychiatric conditions. The long course of the disease also has considerable consequences for next of kin, as well as very high social costs.

The National Quality Registry for Specialized Treatment for Eating Disorders (RIKSÄT) collects data on eating disorder treatment and its results. Of 31 specialised eating disorder units in Sweden, 30 report to RIKSÄT to one extent or another. More than 1 300 patients were entered in the register as of 2006.



One performance measure that can be designed using RIKSÄT data is the degree to which a patient's condition has improved one year after the commencement of treatment. Figure A:48 shows the percentage of patients per region who improved. Improvement means that the patient was diagnosed either as still having an eating disorder but showing signs of progress or as no longer having an eating disorder. More than 30 percent of patients improved nationwide.

All patients whose first visit was in 2003–2005 are included. Almost 1 700 patients were followed up on. The regional data are based primarily on the location of a clinic, not where the patient came from.

As opposed to almost all other indicators, the regions are not ranked or assigned confidence intervals. The purpose of the reporting is not to classify the regions based on the results of their eating disorder treatment efforts. The data do not permit such interpretations. One reason is that the number of patients, and those who were followed up on, was so small in many regions. In addition, only limited information is available about the uniformity of diagnostic methods.

The reason for reporting this summary of eating disorder treatment and its results is to offer an example of quality follow-up in psychiatry that can serve as a model.

B

**Patient
Experience**

B Patient Experience

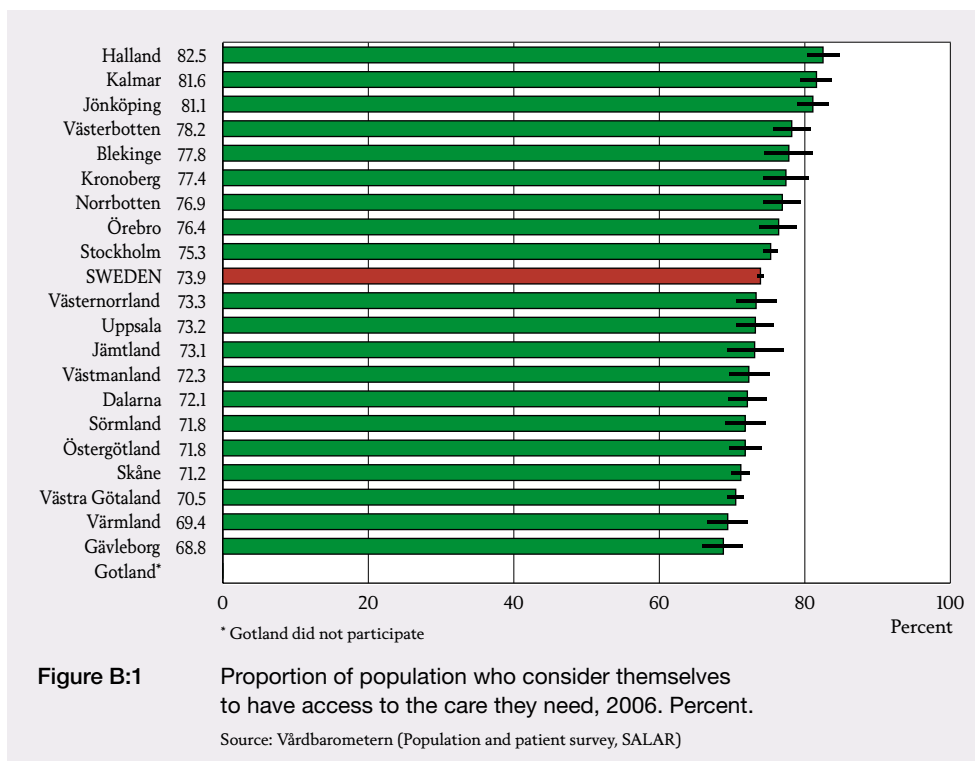
The patient experience group of indicators measures general perceptions among patients and the population as a whole about healthcare and healthcare performance. Patient assessments of the perceived results or health impact of a specific treatment are not included. Two such indicators were presented above under medical results: patient-reported outcome after total hip replacement arthroplasty and ADL ability three months after stroke.

Some of the indicators in this group measure a patient's overall rating of her/his visits at health centres and hospital outpatient clinics. Such indicators reflect actual patient experience. Other indicators shed light on additional issues, such as confidence among the general population in primary and hospital care. Although such indicators do not necessarily show how well the healthcare system is handling and communicating with patients, they are presented here because of their great universal relevance.

The Population and patient survey ("Vårdbarometern" in Swedish) is the source of the data, which cover all of 2006. The data were collected through telephone calls with almost 42 000 randomly selected interviewees. All regions participated except Gotland. The survey included a large number of questions, providing an excellent opportunity for in-depth analyses, particularly at the national level. The Swedish Association of Local Authorities and Regions (SALAR) presents a more comprehensive annual review of the results.

Also reported here are patient perceptions of their hospital care, as well as rehabilitation, after the acute phase of stroke. The data are for 2006. The source is the National Quality Register for Stroke and the follow-up it conducts after three months.

A SALAR task force is preparing the introduction of a national patient questionnaire, the principle of which was approved by a majority of county councils in spring 2007. The primary objective of the questionnaire is to provide health centres, as well as hospital departments and outpatient clinics, with an instrument for development and improvement. But the data can also be used to compare caregivers and regions.



General population – confidence in and availability of health care (B:1, B:2, B:3)

Figure B:1 shows perceptions among members of the general population about their access to health care regardless of whether they have had recent contact with the system or not.

The proportion of respondents nationwide who agreed wholly or in part with the statement that "I have access to the health care I need" was 74 percent in 2006, approximately the same as in 2005. But only 69 percent agreed with the statement in 2002–2004. The 2007 results will show whether the upward trend has continued. One observation is that elderly agreed more often than the 40–49 age group, which had the lowest percentage.

The regions varied from over 82 percent agreement in Halland, Kalmar and Jönköping to below 69 percent in Gävleborg. However, all but five regions were in the 70–78 percent interval. While most regions showed only small differences between 2005 and 2006, there were a few exceptions. Värmland had almost 6 percentage points less agreement in 2006, whereas Blekinge was down by more than 2 percentage points. Norrbotten increased by 4 percentage points.

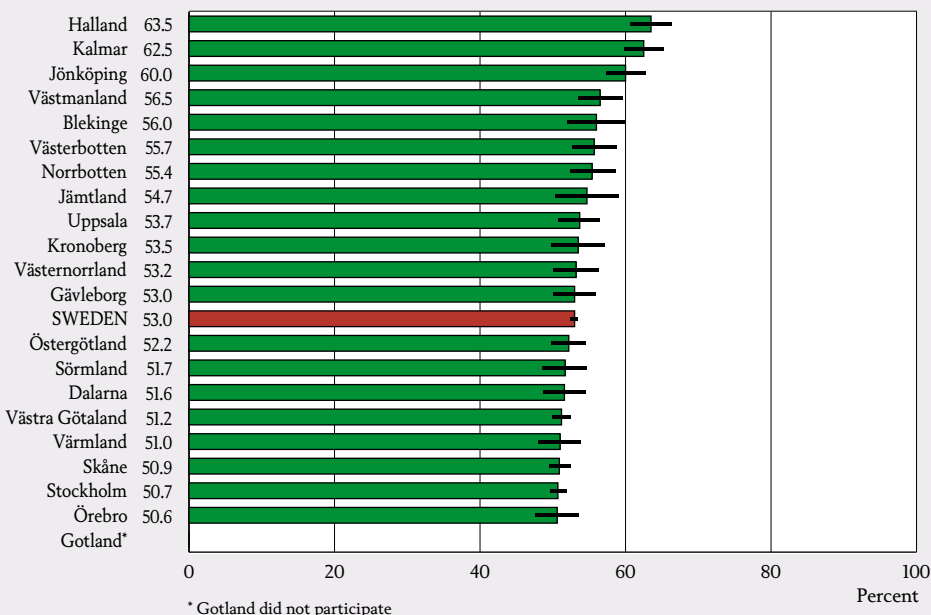
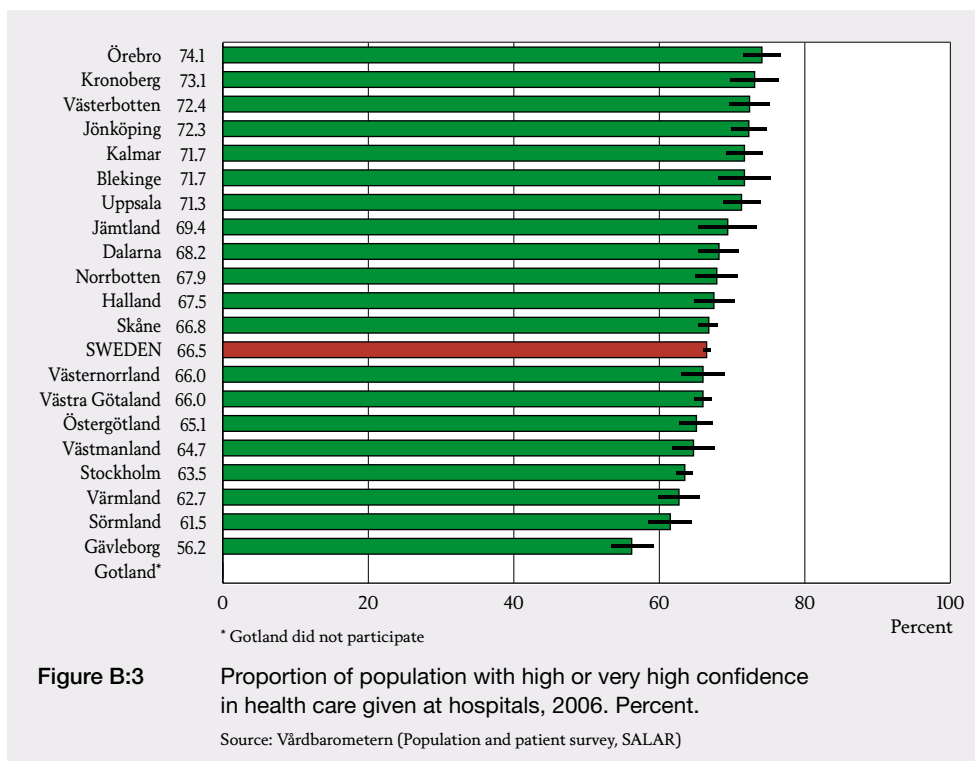


Figure B:2 Proportion of population with high or very high confidence in health care given at primary care centers, 2006. Percent.
Source: Vårdbarometern (Population and patient survey, SALAR)

The next two figures also refer to perceptions among the general population rather than patients per se. The question concerns overall public confidence in care and treatment at health centres (including medical centres and general practitioner’s offices), as well as hospitals.

Figure B:2 presents the results concerning confidence in primary care among the general population. A total of 53 percent of the respondents, an increase of 1 percentage point since 2005, said that they had a lot or quite a lot of confidence in care at health centres. Historical time series are lacking for this question. The same regions – Halland, Kalmar and Jönköping – were at the top as in 2005. Värmland and Östergötland were among the regions where confidence in primary care declined (approximately 3 percentage points). Confidence among the general population in Kronoberg and Västerbotten increased by more than 4 percentage points.

As in 2005, the three largest regions – which contain Sweden’s metropolitan areas – were low and pulled down the national average. Regions where the general population had great confidence in primary care were also high when it comes to “access to the care I need.”



The regional variations were fairly modest. The more important issue is why confidence in care at health centres was generally so low. One possible explanation is that the centres are not adequately available by phone. The problem would be even more serious if it turns out that the general population has low confidence in the competence of general practitioners.

The general population was asked the same question about their confidence in hospital treatment and care. Figure B:3 shows that 66 percent of the respondents said that they had a lot or quite a lot confidence, as opposed to 53 percent for health centres. The positive difference between confidence in hospitals and health centres was greatest in Örebro and Kronoberg and least in Halland and Gävleborg.

Örebro, which did not participate in the Population and patient survey in 2005, was at the top with 74 percent of its general population expressing confidence in hospital treatment and care. Gävleborg was 18 percentage points lower. Confidence among the general populations of several regions changed substantially from 2005 to 2006. Västmanland increased by almost 8 percentage points. Confidence declined most (4–5 percentage points) in Värmland, Östergötland and Gävleborg.

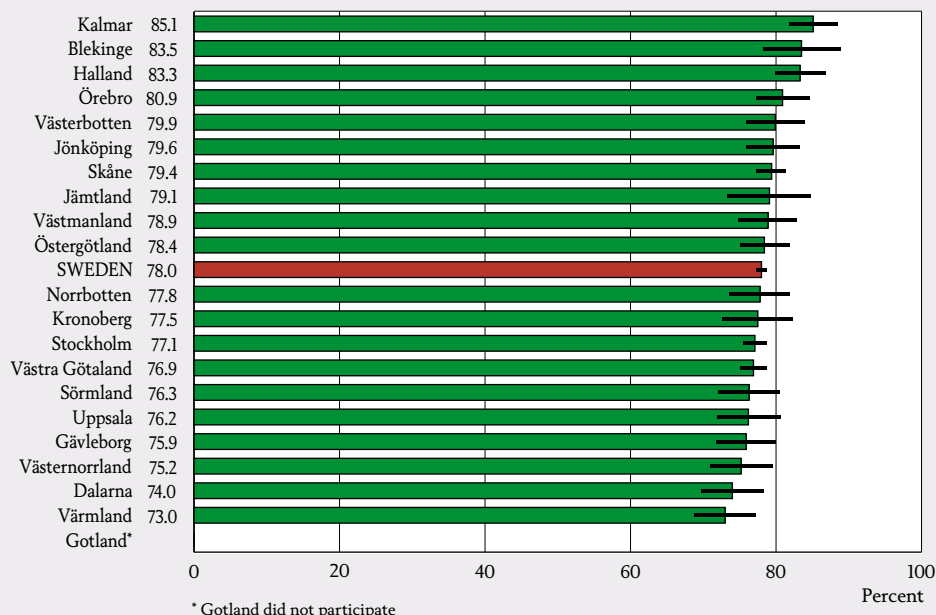


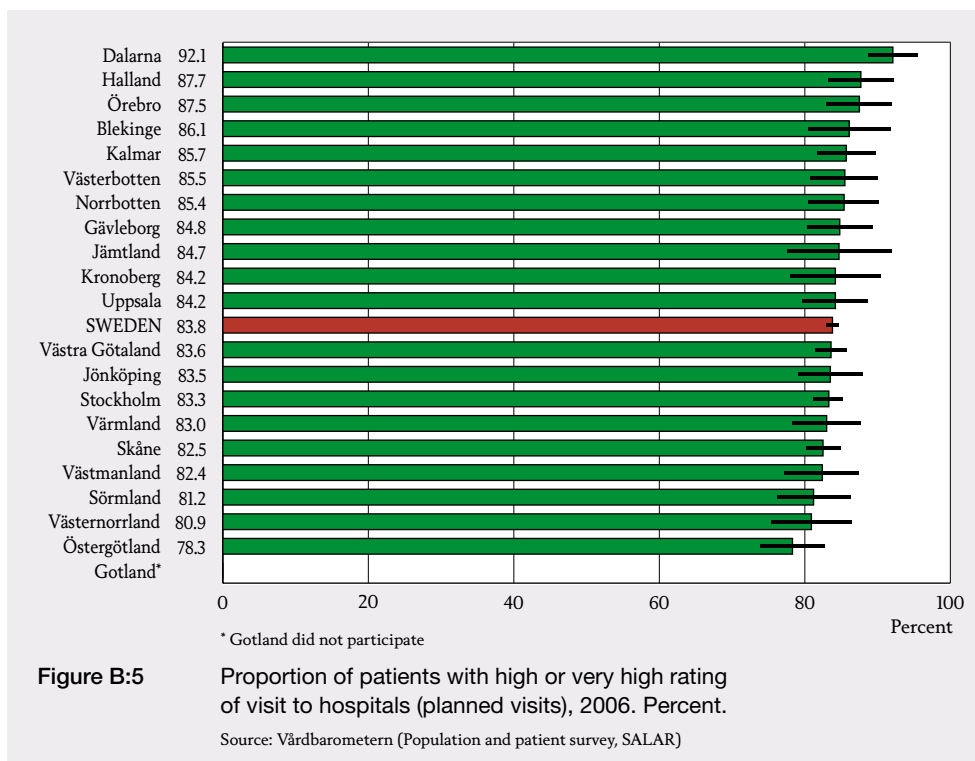
Figure B:4 Proportion of patients with high or very high rating of visit to primary care centers, 2006. Percent.
Source: Vårdbarometern (Population and patient survey, SALAR)

Patient ratings of visits (B:4, B:5, B:6)

Overall patient ratings of their visits are presented here. The Population and patient survey defines a patient as someone who had a visit, either herself/himself or accompanying next of kin or a closely related person, at a health centre or a hospital during the past 12 months.

Figure B:4 shows the percentage of patients who had a favourable perception of their latest visit at a health centre. Having a favourable perception means a rating of 4 or 5 on a 5-point scale. A total of 78 percent of the respondents nationwide had a favourable perception. The results were 75 percent in 2002 and have remained at approximately the same level ever since. The regional variations were modest. The percentage of favourable responses rose sharply (almost 9 percentage points) from 2005 to 2006 in Västmanland, while declining most in Dalarna and Jönköping.

What is particularly striking is that overall patient perceptions of their visits were more favourable than the confidence of the general population in primary care. The nationwide gap was 25 percentage points: 78 percent of patients had a favourable



impression of their latest visit, while only 53 percent of the general population had a lot or quite a lot of confidence in primary care. While a known phenomenon, the difference between perceptions of patients and the general population deserves to be pointed out.

Figure B:5 shows the overall ratings of patients concerning their latest visit at a hospital department or outpatient clinic. Those who went to the emergency room of a hospital were not included. A total of 84 percent of patients nationwide had favourable perceptions, while those in Dalarna were clearly the most satisfied. Worth noting is that Dalarna was toward the bottom when it came to primary care. The regional differences were very small. The results have been at the current level for the past few years.

On a nationwide basis, patients who had a visit at a hospital had somewhat more favourable perceptions (84 percent) than those who had a visit at a health centre (78 percent). For the general population on the other hand, the confidence gap between hospitals and primary care was a much greater, namely 13 percentage points.

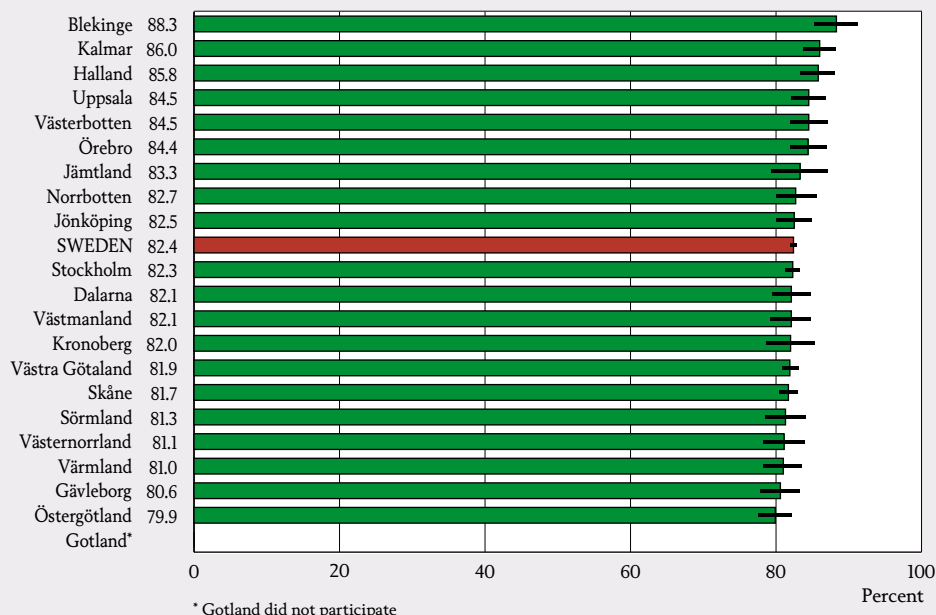
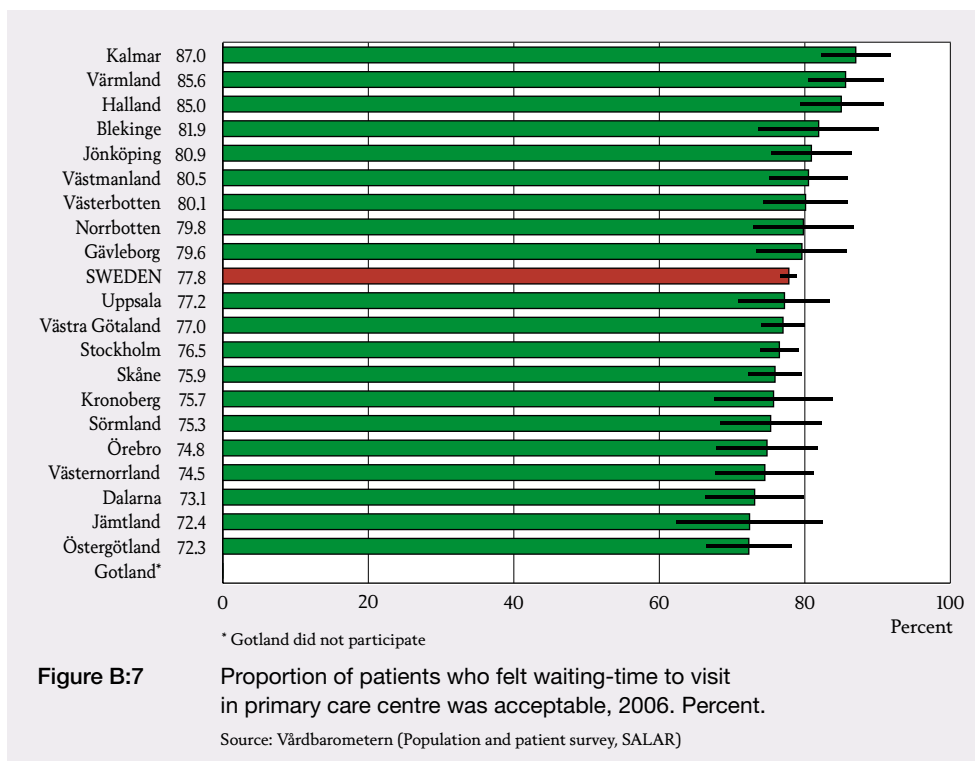


Figure B:6 Proportion of patients who felt they received the help they expected at the last visit, 2006. Percent.
Source: Vårdbarmetern (Population and patient survey, SALAR)

Figure B:6 shows how patients responded to the statement that they had received the help that they had expected during their visit. All types of outpatient clinics were included. A total of 82 percent agreed with the statement either wholly or in part. The regional variations were very modest – less than 10 percentage points from the highest to lowest region. All in all, 8 percent of the respondents said that they did not receive the help that they had expected (not reported).

Reasonable waiting times and phone availability in primary care (B:7, B:8)

The Population and patient survey asked patients who had a visit at a health centre whether they felt that the waiting time was reasonable. Figure B:7 shows the percentages by region who answered yes in 2006. A total of 78 percent of patients nationwide thought that their waiting time was reasonable. With the exception of Värmland, the regions with the best results were those that had scored high on the other primary care indicators above.



The results may be compared with the availability of primary care in the follow-up on Sweden's healthcare guarantee program, measured as the percentage of patients who were given a doctor's appointment within 7 days in March 2006. According to the follow-up, Västerbotten had the lowest actual availability but its patients were quite convinced that their waiting time was reasonable. Värmland patients were the second most satisfied even though actual availability was below the nationwide result in March 2006. Blekinge patients exhibited the same pattern. One region with the opposite pattern was Östergötland, where relatively few patients thought that their waiting time was reasonable even though the region had medium availability in March 2006. Such differences suggest that factors other than actual availability also affect patient satisfaction when it comes to waiting times for appointments.

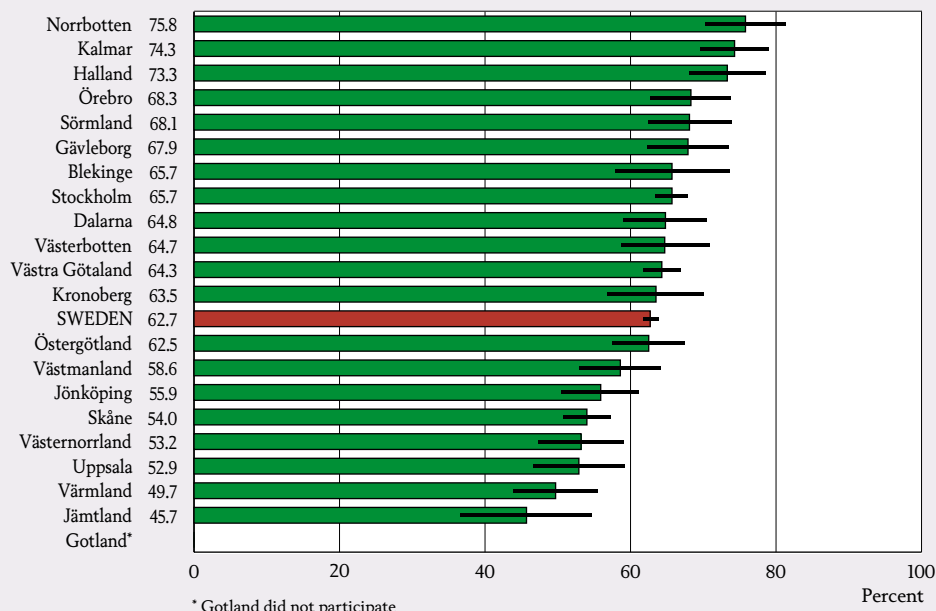


Figure B:8 Proportion of patients who felt it easy or very easy to reach primary care centre by telephone, 2006. Percent.
Source: Vårdbarometern (Population and patient survey, SALAR)

Telephone availability is integral to availability of the healthcare system in general. One Population and patient survey question addresses patients who visited a health centre and phoned in advance. Figure B:8 shows the percentage of those patients who felt that it was easy or very easy to reach the centre by phone.

The national result was close to 63 percent, having risen steadily from 50 percent in 2002. But the regional differences were large in 2006, as they had been in 2005. Favourable responses in Norrbotten, Kalmar and Halland at the top were more than 20 percentage points higher than Uppsala, Värmland and Jämtland at the bottom. Gävleborg, Västmanland and Dalarna had substantially better results (7–11 percentage points) in 2006 than 2005. The biggest decline was in Uppsala.

Stroke patient ratings of hospital care, as well as rehabilitation (B:9, B:10)

The National Quality Register for Stroke follows up three months after the acute phase. A questionnaire for patients and their families seeks to determine how satisfied they were with the care that they received. There are more questions about patient satisfaction than the two we present here.

The first question is about how satisfied patients were with the hospital care they received. Figure B:9 shows the responses, reported separately for women and men. A total of 93 percent of the male respondents and 91 percent of the female respondents were satisfied or highly satisfied. Thus, the nationwide gender difference was modest. The results were in line with the 2006 report, 1 percentage point lower for both women and men.

Given the very favourable responses, the regional differences were quite modest. Uppsala, Sörmland and Halland reported the lowest results for both women and men.

Men in Jämtland were considerably more (almost 9 percentage points) satisfied than women. The same was true of Uppsala and Sörmland, though the gap was narrower. Both women and men in Halland were considerably less satisfied in 2006 than 2005.

The other question which we present here concerned rehabilitation. Rehabilitation is vital to stroke care, both at the hospital and after discharge. This indicator is also revealing because it can reflect cooperation among various providers, caregivers and medical professions. Stroke care demands a variety of participants. Figure B:10 presents the results.

Both women (73 percent) and men (76 percent) were considerably less satisfied with their rehabilitation than their hospital care. Strictly speaking, the question addresses rehabilitation both at the hospital and after discharge. But there is reason to believe that most patients were thinking about post-hospital rehabilitation when they answered. The lower level of satisfaction is a rather clear indication that rehabilitation following hospitalisation is inadequate in various ways.

The regional variations were relatively large. Blekinge appears to have a highly successful model of stroke rehabilitation, or at least patients perceive it that way. Both for women and men, the number of satisfied respondents in Blekinge was approximately 10 percentage points greater than in the second best region. There was a considerable gap between Blekinge and the regions with the lowest percentage of satisfied women and men.

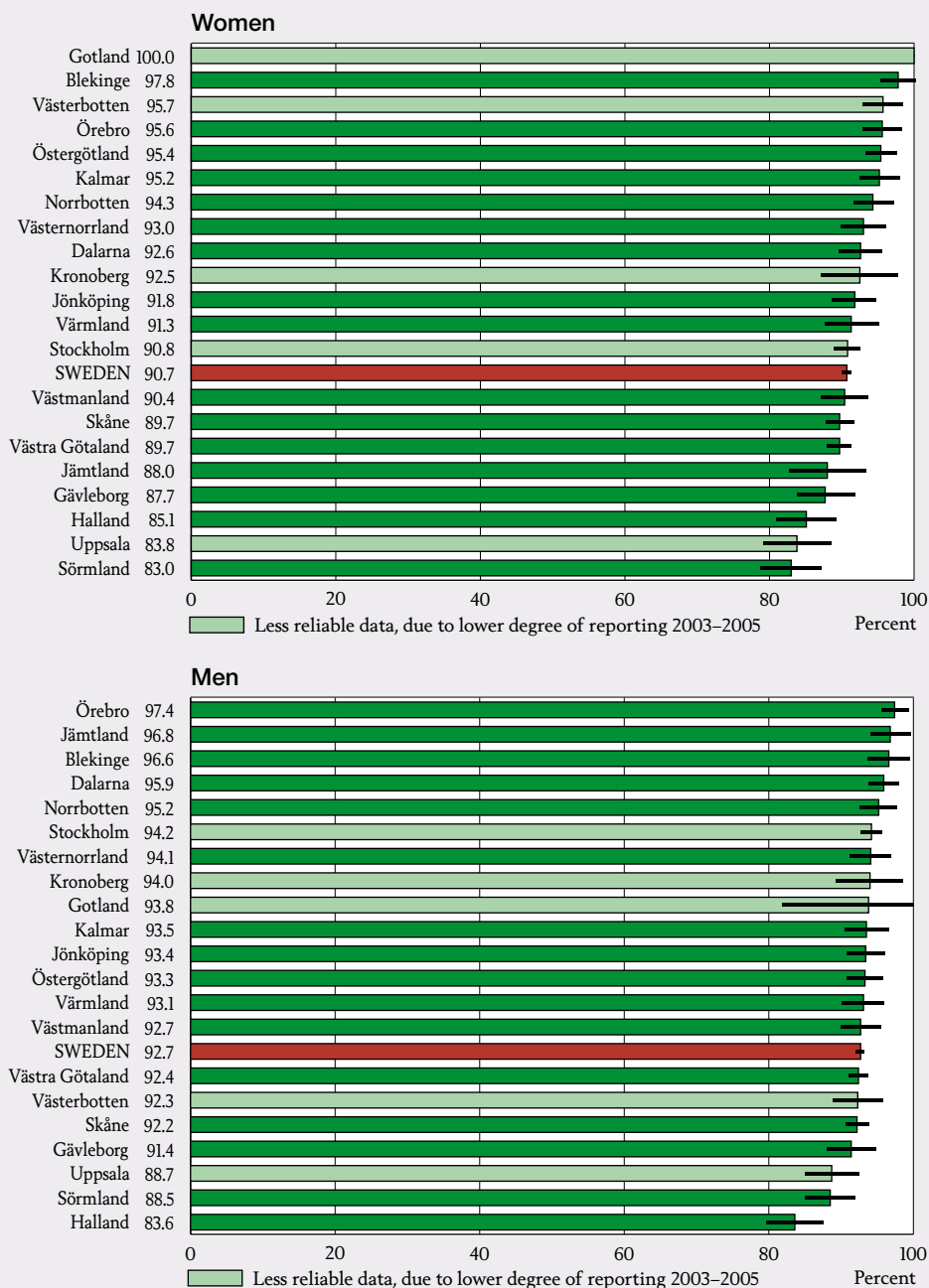


Figure B:9

Proportion of stroke patients who were satisfied or highly satisfied with hospital care, 2006. Percent.

Source: National Quality Register for Stroke

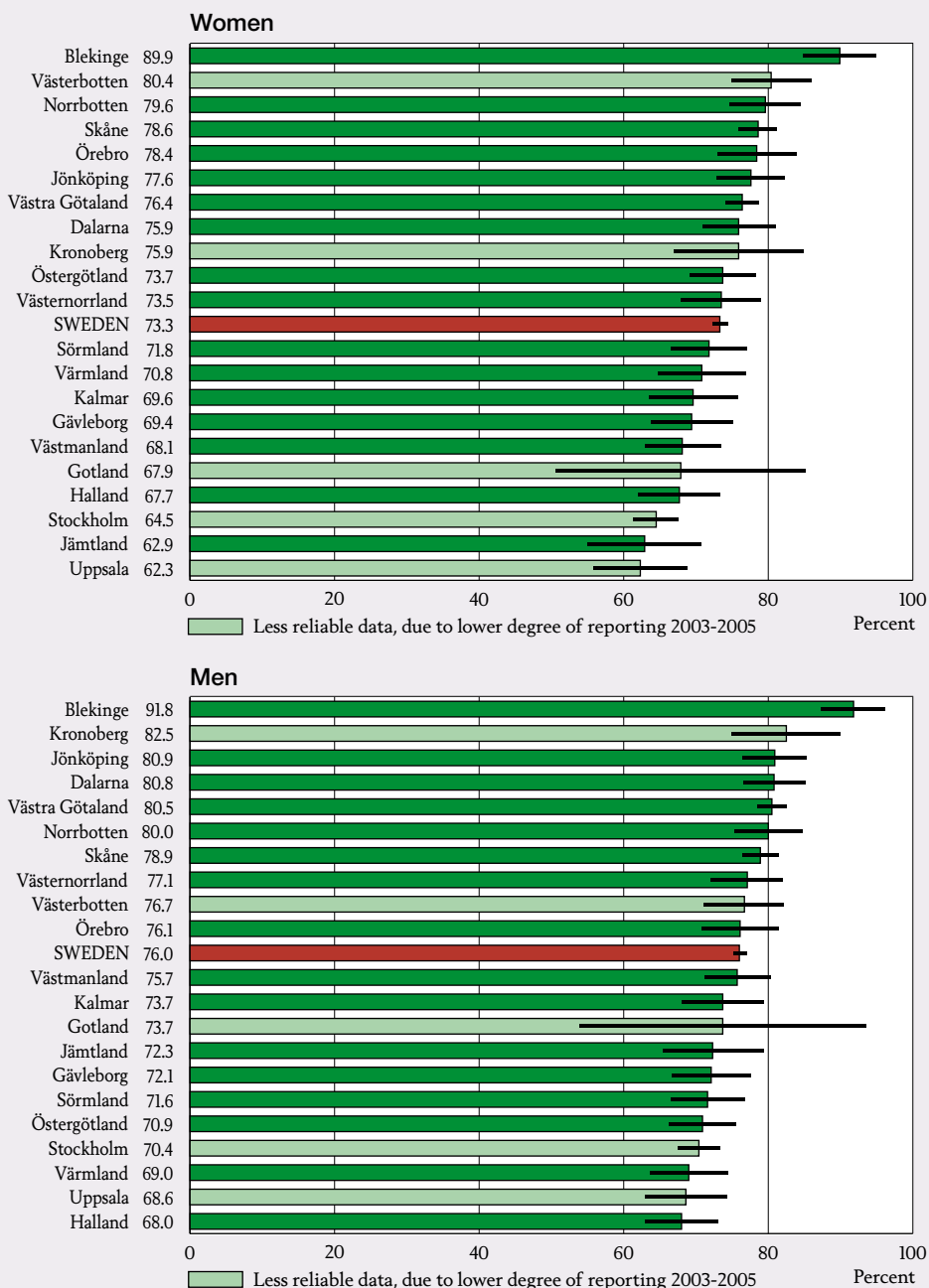


Figure B:10

Proportion of stroke patients who were satisfied or highly satisfied with rehabilitation services, 2006. Percent.

Source: National Quality Register for Stroke

C

**Time-related
Availability**

C Time-related Availability

The indicators that we present here concerning time-related availability are related to Sweden's healthcare guarantee, which articulates a clear national policy with specific targets for all scheduled care.

The targets are expressed as 0, 7, 90, 90 – the maximum waiting time in days for various steps in the healthcare process. Primary care is to offer contact on the phone or in person the same day (0). If needed, a doctor's appointment is to be offered within 7 days. An appointment with a specialised caregiver is to be offered within 90 days after a referral decision. An intervention is to be offered within 90 days after being ordered.

SALAR monitors availability pursuant to the healthcare guarantee and regularly publishes the results for both primary and specialised care. Monitoring the guarantee is also part of the NBHW's mission from the government. A final report is to be released in November 2007.

We present four indicators here based on data as of 30 April 2007. The indicators have been chosen to provide an overview of availability in the various regions. Two indicators concern primary care and two concern specialised care. No indicators for specific interventions, areas of specialised care or types of outpatient clinics are presented. The source of data about availability and waiting times is the National Database on Waiting Time and Waiting Lists, which covers both primary and specialised care.

Availability of healthcare is an important policy issue and is often described as the area for which Sweden ranks low in international comparisons. With that in mind, a number of indicators should have been presented here. The availability of data is relatively good thanks to national waiting time reporting, although the response rate varies from region to region.

Waiting time reporting for specialised care is designed primarily to reflect the availability of departments and outpatient clinics for the information of caregivers and patients, as well as to support follow-up at that level. Key variables in the National Database on Waiting Time and Waiting Lists cannot be properly presented at the regional level, but only at the hospital and outpatient clinic level. One such variable is the percentage of patients who received treatment or an appointment at an outpatient clinic within the 90 days specified by the healthcare guarantee.

PRIMARY CARE

Proportion of patients who were given a doctor's appointment within a week – primary care (C:1)

Waiting times for an appointment with a general practitioner are measured each March and October. The data are reported through an online system provided by SALAR. The data presented here are from the latest survey on 26–30 March 2007. All health centres were expected to submit data. A total of 929 centres and private general practitioners with healthcare agreements participated in the survey. The results per centre appear at www.vantetider.se

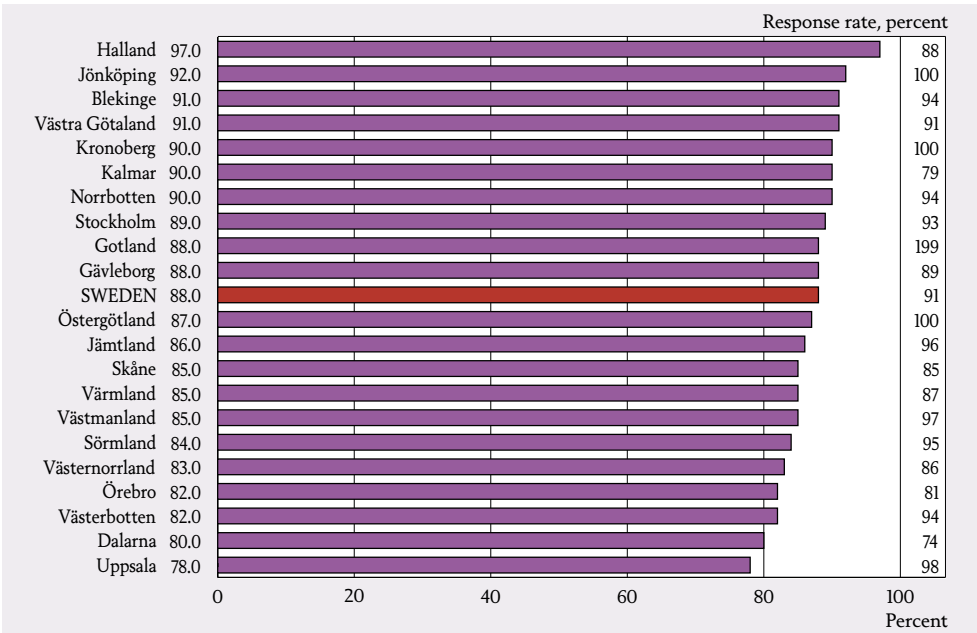


Figure C:1 Proportion of patients who were given doctor's appointment within 7 days from first contact, March 2007.
Source: National Database on Waiting Lists and Waiting Times

A total of over 130 000 appointments covered by the healthcare guarantee were reported. Doctor's appointments for certificates of health or checkups/follow-ups were not included. When reporting waiting times, the health centre could specify whether the patient chose not to take advantage of the doctor's appointment initially offered. More than 10 000 appointments, or 8 percent, fell into that category. They were not included in the reporting.

The nationwide response rate was 91 percent, the same as in March 2006. Eight regions had response rates below 90 percent. Dalarna, Kalmar and Örebro had the poorest response rates. Four regions had 100 percent response rates.

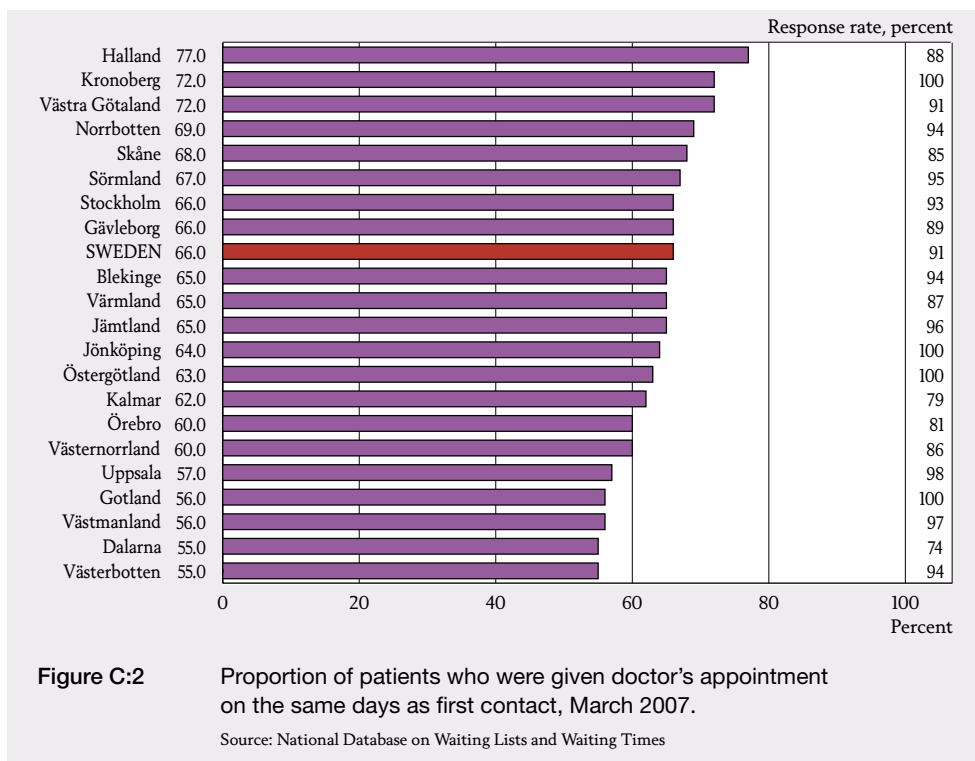
Figure C:1 shows the percentage of patients who were given doctor's appointments within 7 days (the healthcare guarantee target) during the measurement period. The figure also presents response rate per region.

The nationwide result was 88 percent, 1 percentage point higher than the March 2006 survey. Halland was at the top (97 percent) again, while Uppsala, Dalarna and Västerbotten remained comparatively low. Regional variations narrowed somewhat.

No significant gender differences were apparent at the national level. A total of 87 percent of women and 88 percent of men were given doctor's appointments in accordance with the target. The reporting (not in Figure C:1) also indicates the period within which other appointments were given. A total of 7 percent of all appointments nationwide were within 8–14 days after the patient had contacted the healthcare system. Thus, 95 percent of all patients were given appointments within 14 days.

Proportion of patients who were given a doctor's appointment the same day – primary care (C:2)

Figure C:2 shows the percentage of patients who were given a doctor's appointment the same day as they made contact with the healthcare system. While not a healthcare guarantee target, an appointment the same day is a revealing measure of availability.



A significant percentage of all patients covered by the healthcare guarantee (entitled to a doctor's appointment within 7 days) were given an appointment the same day. The nationwide rate was 66 percent. Halland, Västra Götaland and Kronoberg all had rates of 70 percent or above. Even the lowest regions had rates of 50 percent or above.

The fact that so many patients receive appointments the same day adds some perspective to the discussion of how available primary care actually is. A possible conclusion is that availability is primarily a telephone issue. SALAR's follow-up of the healthcare guarantee gauges and reports phone availability through the "calls answered" measure. Due to methodological problems and lower response rates, those data are not presented here.

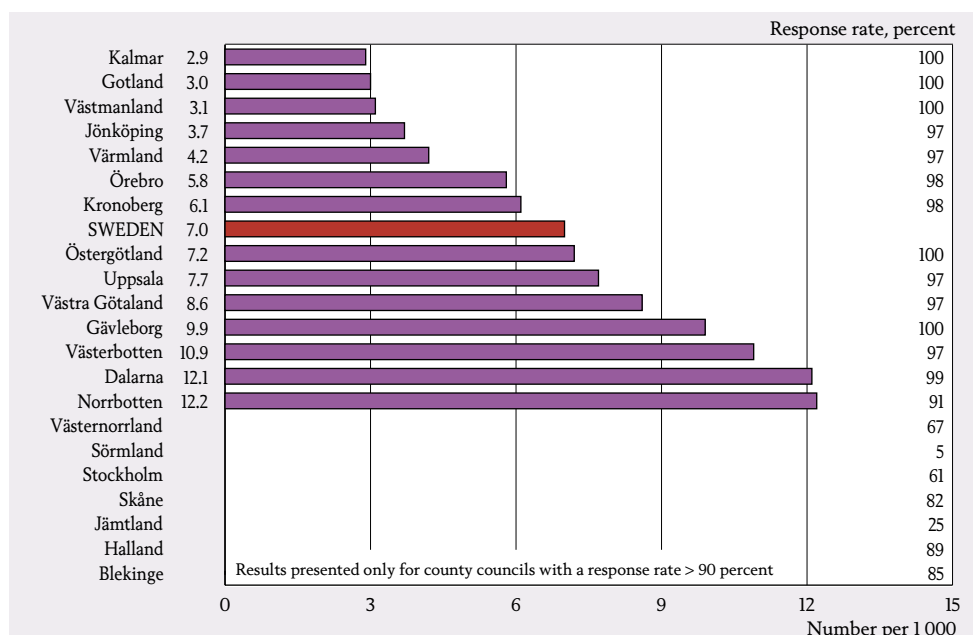


Figure C:3 Number of patients waiting longer than 90 days per 1 000 inhabitants – outpatient visits, hospitals, April 2007.
Source: National Database on Waiting Lists and Waiting Times

SPECIALISED CARE

Number of patients with waiting times longer than 90 days – specialised outpatient clinics (C:3)

When it comes to specialised care, the National Database on Waiting Time and Waiting Lists contains data about the availability of various types of outpatient clinics for appointments and examinations, as well as 44 types of treatments. Data concerning current waiting times are updated continually, whereas data about the number of patients who are waiting and those who have been waiting for longer than 90 days are updated monthly. The actual results as subsequently followed up on are updated once every four months.

While response rates have improved, troublesome gaps in regional reporting remain. As of 30 April 2007, the average response rate was 85 percent for regional specialist units and 89 percent for units that provided treatment or surgery.

Data are reported only for regions with a response rate of at least 90 percent. For the April 2007 survey, 14 regions met the criterion when it came to appointments and 13 when it came to treatments. The reason for choosing this strict criterion is that low

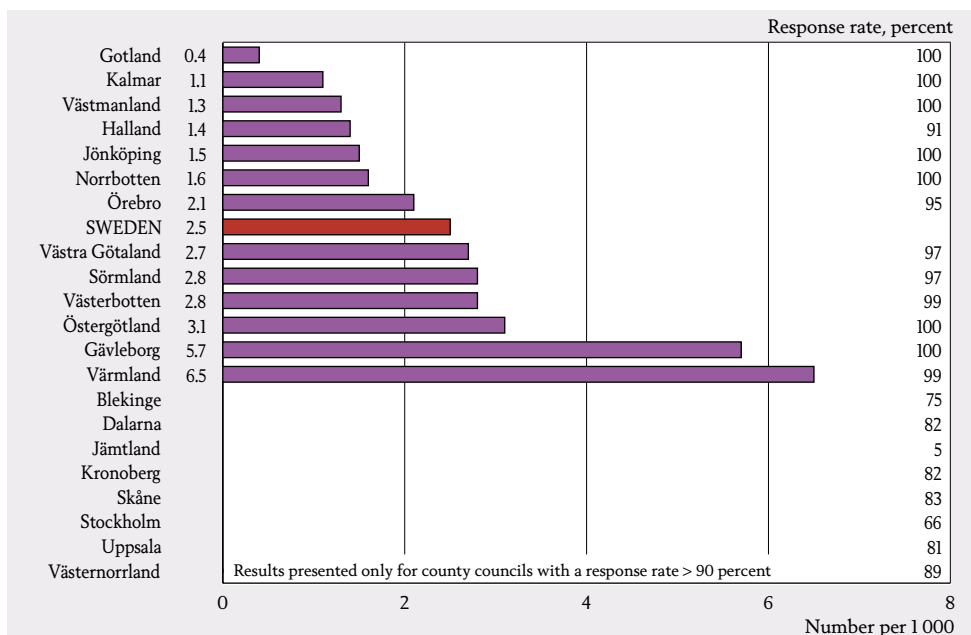


Figure C:4 Number of patients waiting longer than 90 days per 1 000 inhabitants – selected operations and treatments, April 2007.

Source: National Database on Waiting Lists and Waiting Times

response rates always reduce the reported number of waiting patients and thereby generate deceptively favourable results.

Figure C:3 shows the number of patients per 1 000 inhabitants who waited longer than 90 days for an appointment at an outpatient clinic. More than 57 000 patients nationwide waited for longer than 90 days. The regional variations were large. The lowest regions (3 patients per 1 000 inhabitants) were Kalmar, Gotland and Västmanland. That represented a total of 682 patients in Kalmar, 171 in Gotland and 803 in Västmanland. The regions at the bottom of the figure had four times as many (12) per 1 000 inhabitants. That corresponded to a total of 3 322 patients for Dalarna and 3 076 for Norrbotten.

Number of patients with waiting times longer than 90 days – intervention and treatment (C:4)

The data for the number of patients who waited cover only the 44 types of treatments included in the reporting, whereas the healthcare guarantee covers all scheduled care. But the 44 types of treatments include all those that normally come up in discussions about inadequate availability and long waiting times for surgery.

Certain methodological difficulties must be taken into consideration. The criteria and medical indications that determine whether a patient will be put on a waiting list or schedule may vary. Analyses have revealed that many patients who are on a healthcare waiting list would no longer benefit from any intervention or treatment. In other words, data about the number of patients who are waiting may be exaggerated. On the other hand, anything less than a 100 percent participation rate understates actual waiting times.

Figure C:4 shows that fewer patients waited for treatments than appointments at outpatient clinics, and that there was a substantial difference between the regions at the top and bottom. Almost 23 000 patients nationwide had waited for longer than 90 days. That included 260 patients in Kalmar, 375 in Västmanland and 449 in Jönköping. At the other extreme were 1 554 patients in Gävleborg and 1 762 in Värmland.

D

Costs

D Costs

In order to compare the efficiency of health care in the various regions, indicators of quality and results such as those presented in groups A-C above must be related to costs. Measures of medical results, patient experience and availability reflect how well the healthcare system meets its targets. But efficiency is the ratio of target fulfilment to resources expended, and the best measure of resources expended is cost.

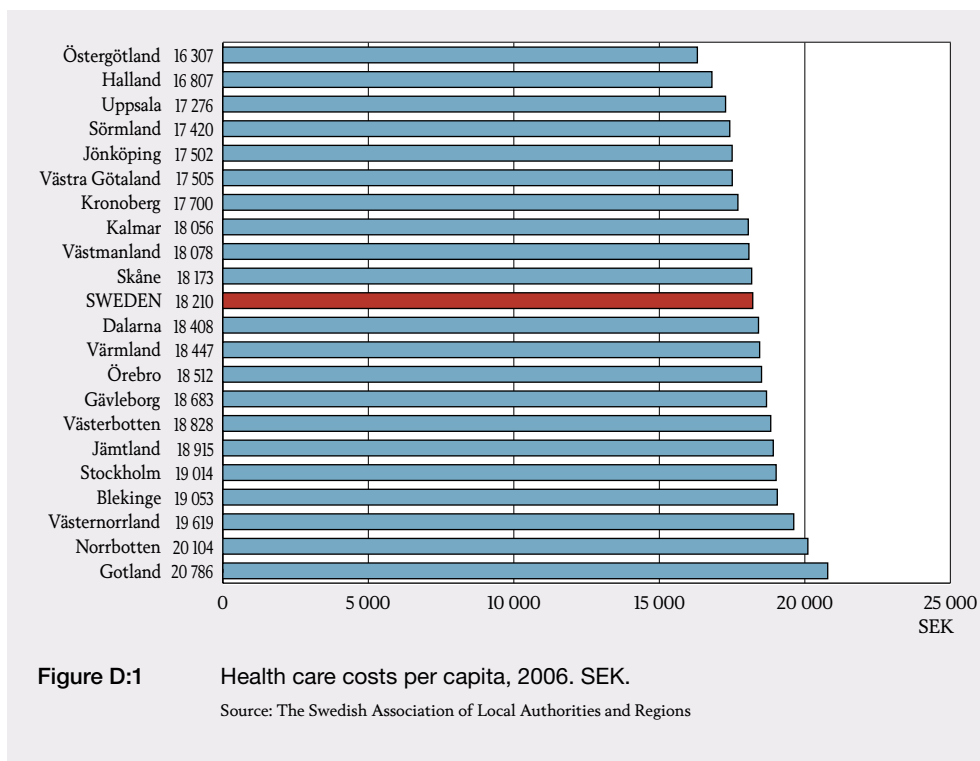
This section compares the various regions in terms of 13 cost indicators. Six of the indicators concern cost per capita. The three indicators that concern costs per inpatient care event or outpatient visit are inversely related to productivity, assuming that quality remains constant. Four indicators concern cost-effective treatment options – drug therapies for high lipids and gastric ulcers, as well as two common surgical procedures.

The data for regional costs are taken from the accounts that SALAR compiles on an annual basis. Those statistics break costs down into categories such as primary care, specialised medical care and specialised psychiatric care. In order to be directly related to quality and results, costs must be reported for individual groups of diseases. That is possible for regions and hospitals that use the costs per patient (CPP) reporting system. The system, which is rapidly expanding, covered approximately 50 percent of all inpatient medical care for 2006. CPP reporting does not currently permit any meaningful regional comparisons.

COST PER CAPITA

Healthcare cost per capita (D:1)

Net costs are normally used for the purpose of regional comparisons. Net costs are those that are financed by county council taxes, general government subsidies and net financial income. Patient fees and earmarked government subsidies are deducted. All regional costs for prescription drugs are included. Those costs were previously reported after government subsidies had been deducted.



Net costs are for health care of the region's inhabitants. Costs for services purchased from other regions or private caregivers are included, whereas costs for services that the region has sold to others are not included.

Figure D:1 shows regional net healthcare cost per capita in 2006. Dental care and home nursing are not included in the comparison – home nursing is excluded in order to increase regional comparability. Regional net healthcare costs averaged 18 200 kronor per capita in 2006, ranging from 16 300 kronor in Östergötland to 20 800 kronor in Gotland. The variation represents approximately 10 percent of all costs. In other words, if all regions had been in line with Östergötland, total net healthcare costs would have been about 10 percent lower.

Actual versus expected healthcare costs (D:2)

Healthcare costs cannot be identical in all regions. The regions face different challenges when providing health care, and structural factors – such as the age structure of the population and the occurrence of various diseases – affect costs. The system of economic equalisation for local governments strives to compensate for those factors. For each region, the system calculates an annual standard healthcare cost based on the above uncontrollable factors. In accordance with the economic equalisation model, regional variations in the standard cost reflect structural differences.

For instance, Västernorrland's standard cost is 4 percent above the national average. Due to a larger percentage of elderly in the population and greater frequency of certain costly diseases, expected costs are above average. But actual costs in Västernorrland are 7 percent above average. The ratio between a region's actual costs and its standard cost per capita is a measure of its costs after adjustment for structural differences.

Figure D:2 shows that ratio as an index of deviation from the national average. The figure should be interpreted as follows. Västernorrland's actual cost per capita is 7 percent above the national average, whereas the standard cost is only 4 percent

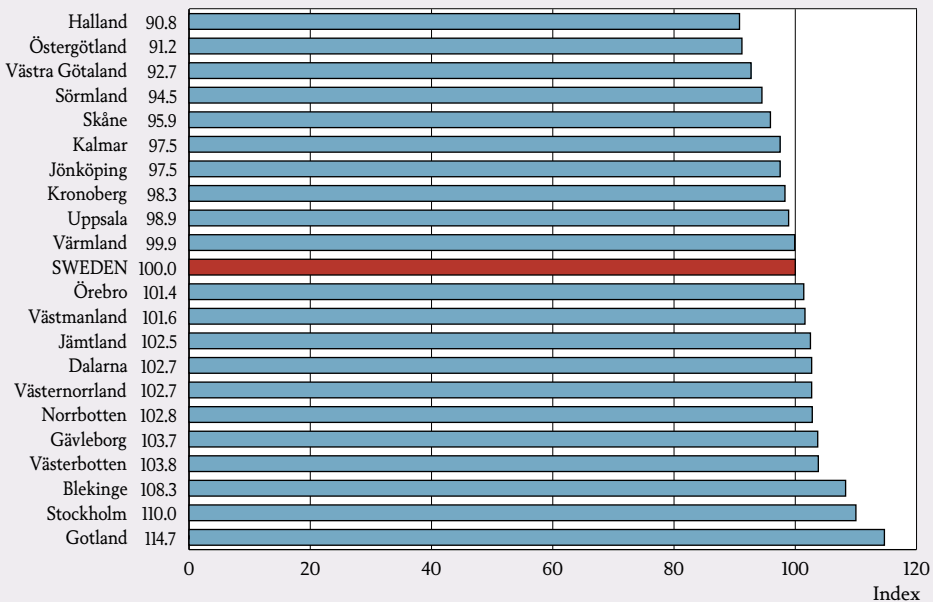


Figure D:2 Health care costs per capita, actual compared to expected cost, 2006. SEK.

Source: The Swedish Association of Local Authorities and Regions

above the average. Thus the region's index number is 103 ($1.07/1.04 \times 100$), i.e., its actual costs are 3 percent above its expected costs.

The figure shows that Östergötland and Halland have the lowest costs even after adjustment for structural differences. In the case of regions such as Stockholm and Östergötland, the cost difference is greater after adjustment. The fact that the adjusted cost per capita varies from region to region may reflect differing objectives or levels of healthcare efficiency. But the variation may also be due to factors that regions have little control over but that the economic equalisation system does not take into consideration. Among such factors are regional wage differences, which will be part of the equalisation effort as of 2008.

Net cost per capita – primary, specialised medical care and specialised psychiatric care (D:3, D:4, D5)

The following figures show the net cost per capita for primary care, specialised medical care and specialised psychiatric care. The comparison looks at actual costs without adjusting for the varying regional resources and needs. The standard cost is calculated at the total healthcare level only.

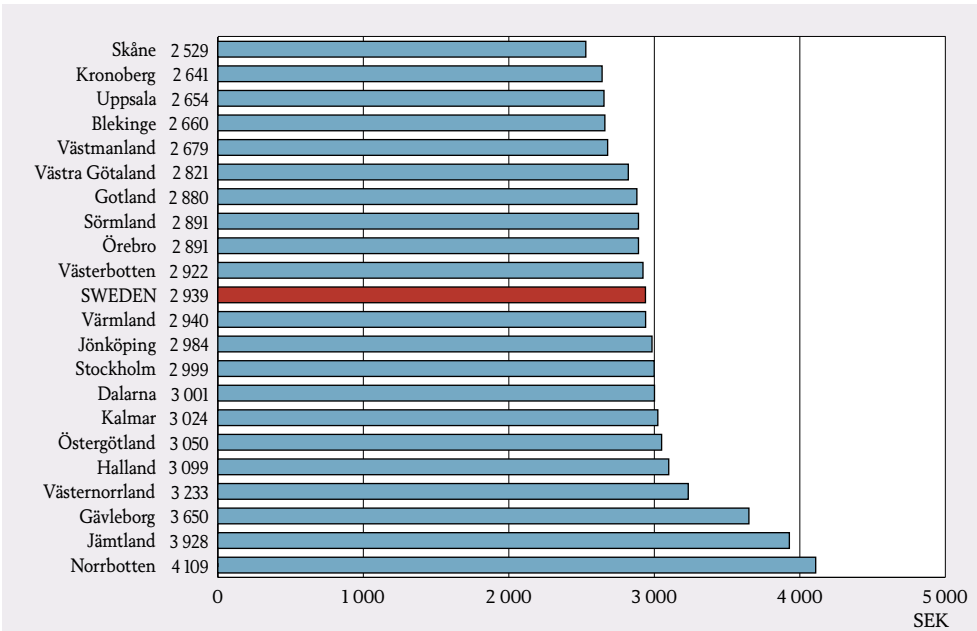


Figure D:3 Primary health care costs per capita, 2006. SEK.
Source: The Swedish Association of Local Authorities and Regions

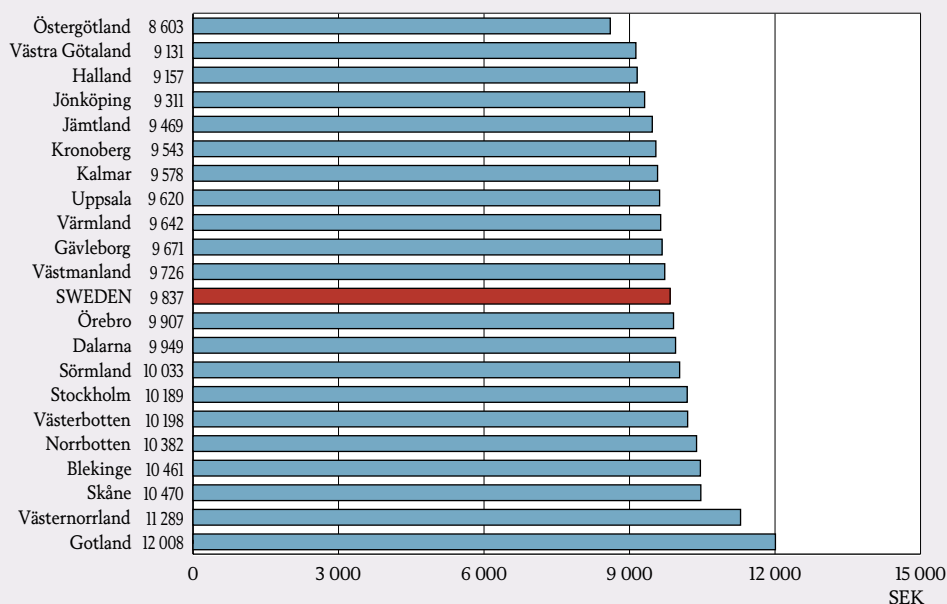


Figure D:4 Costs per capita for specialised somatic care, 2006. SEK.

Source: The Swedish Association of Local Authorities and Regions

The primary cost per capita averaged just below 3 000 kronor in 2006. Several sparsely populated regions – particularly Norrbotten, Västerbotten and Jämtland – have inpatient beds in primary care facilities, thereby boosting primary care costs. The cost comparison is also partially affected by the fact that primary care to some extent has different missions from region to region.

Regional cost differences for primary care have narrowed in recent years. Last year's report covered 2004 costs. The regions whose primary care costs were low at that point have seen them rise faster than average over the past two years. That is true of regions such as Uppsala and Skåne, even though their primary care costs remain below average.

Figure D:4 shows that the cost of specialised medical care was 9 800 kronor per capita in 2006. Relatively speaking, the regional cost differences are considerably smaller for specialised medical care than other health care. Specialised medical care costs for both Gotland (which had the highest cost per capita) and Östergötland (which had the lowest) have risen a good deal faster than the national average since 2004. Among the regions where specialised medical care costs have increased slowly are Örebro, Uppsala and Värmland.

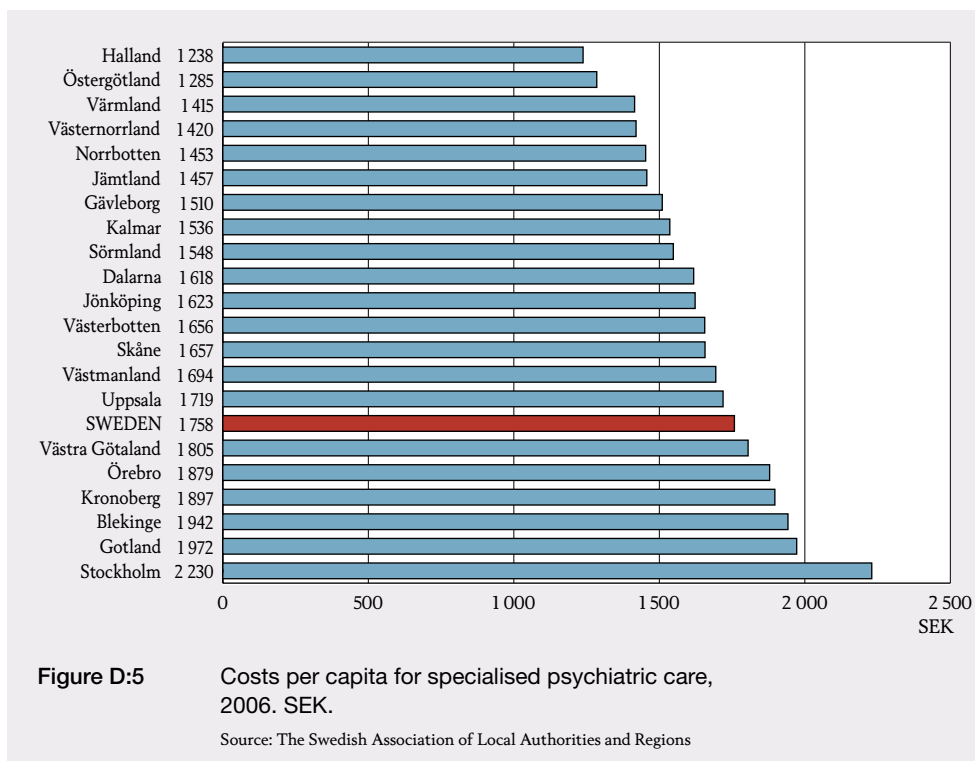


Figure D:5 shows that Stockholm had considerably higher costs than other regions when it came to specialised psychiatric care. One explanation may be that psychiatric problems are more common in a metropolitan area. Nevertheless, the gap between Stockholm and the rest of the country has narrowed over the past two years.

Healthcare cost trends (D:6)

Figure D:6 shows the total percentage change in cost per capita from 2004 to 2006. The rate of increase refers to net costs in current prices, i.e., unadjusted for wage and price growth. To increase comparability, temporary restructuring costs are excluded.

The regional variations were large – five regions had total cost increases of 10 percent or more, whereas five other regions had increases of approximately 6 percent. Nevertheless, the period is too short and too much subject to temporary factors to speak of long-term trends for particular regions.

Average wage and price growth in terms of the county council price index totalled 4.6 percent during the period. In other words, 2.6 percentage points of the 7.3 percent national increase reflected real costs, whereas the rest reflected inflation. No

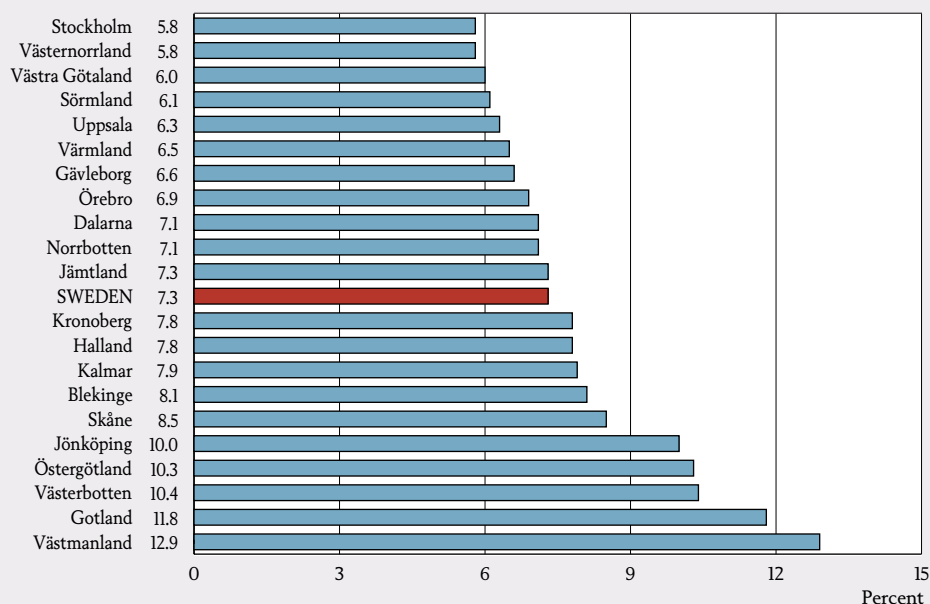


Figure D:6 Change in health care costs per capita 2002–2004. Percent. Current prices.

Source: The Swedish Association of Local Authorities and Regions

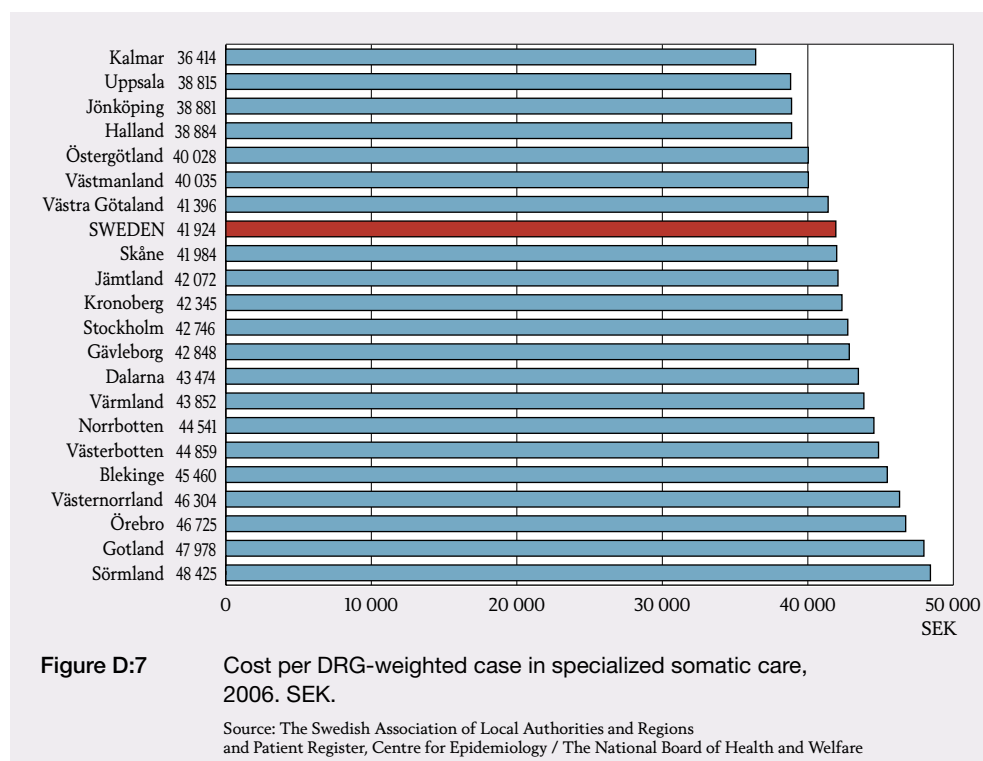
wage and price growth data are available for individual regions. As a result, a similar adjustment is not feasible at the regional level. An approximation is obtained by using the national county council price index, which measures wage and price growth for the country as a whole. The calculation shows that the real cost increase was 7.9 percent for Västmanland and 1.1 percent for Stockholm.

COST PER CARE EVENT OR VISIT

Cost per DRG-weighted cases (D:7)

Regional healthcare cost variations may be due to differences in care consumption, or they may be due to differences in the cost of individual care events or visits. Which one of the two factors is at work is of great significance when analysing and interpreting high costs. The comparison presented here looks only at cost per care event or visit, not consumption.

The Patient Register contains all care events and doctor's appointments in specialised medical care, including data about the patient's diagnosis and age. Thus, each event and appointment can be assigned a diagnosis-related group (DRG) weight.



The DRG system classifies individual contacts with the healthcare system based on resource consumption and the medical issue involved. The data for calculating DRG weights are taken from the CPP database, which has cost statistics for individual contacts with the healthcare system, including the same information as the Patient Register.

Figure D:7 shows the cost per DRG-weighted case for the care that inhabitants of each region received. That is an indicator of healthcare productivity, i.e., performance in relation to costs. Worth noting is that the indicator refers to cost per consumed DRG. For instance, Gotland's cost per DRG is affected by the price of healthcare services that it purchases from Stockholm.

The calculation covers all specialised medical care, both inpatient and outpatient, in the various regions. This measure compares a region's net costs for inpatient and outpatient medical care with the care consumption, in terms of DRG-weighted cases, of its inhabitants in both their own and other regions.

The apparent regional differences in cost per DRG may partly reflect methodological problems. The quality of primary classification of various treatment methods

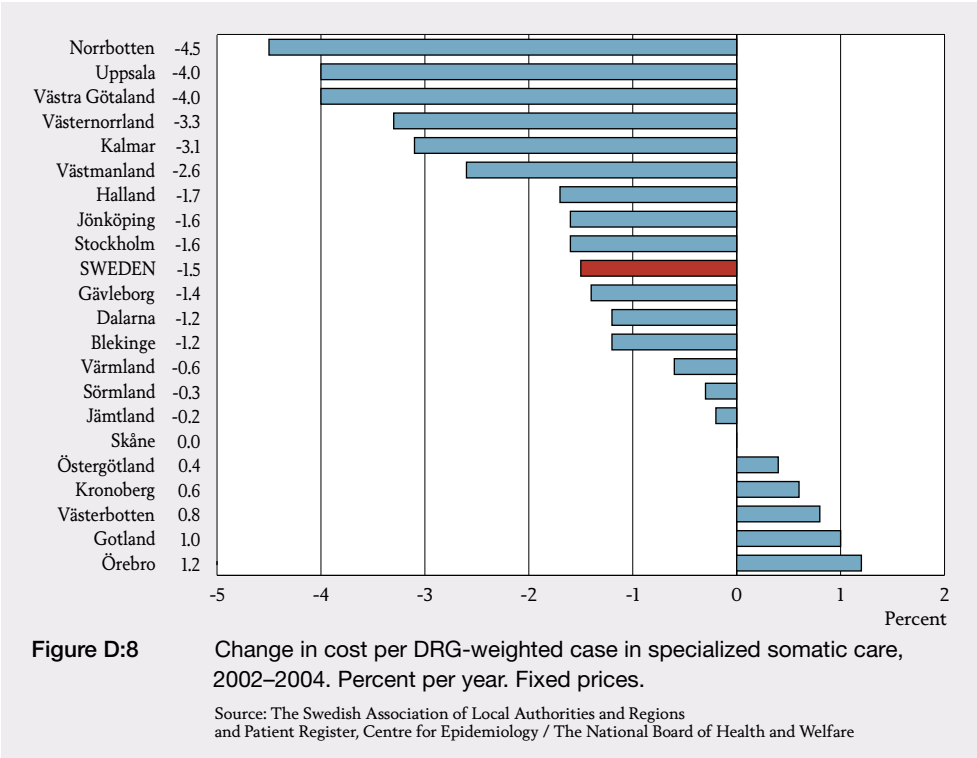
and diagnoses, particularly when it comes to outpatient care, still varies from region to region. There are also structural factors that have not been taken into consideration. Given variations in geographic conditions, wages and rents, all regions cannot have the same costs. DRG adjusts for differences in patient mix, patient age and disease severity, but not for other factors.

Cost per DRG-weighted cases, change from 2004 to 2006 (D:8)

Despite various methodological problems with these measurements, studying healthcare productivity trends is important. Figure D:8 shows the annual fixed-price change in cost per DRG-weighted cases for specialised medical care from 2004 to 2006. Lower costs through the years reflect higher productivity, and vice versa

The national cost per DRG-weighted cases decreased by 1.5 percent per year. Six regions had annual decreases of 2.5 percent or more. That is a strikingly high result, particularly during a period when total healthcare costs grew relatively fast (though not as much in all regions).

The data are associated with a high degree of uncertainty. Some of the increase in consumed DRG-weighted cases, particularly in outpatient care, might be a tech-



nical result of hospitals having improved their reporting to the Patient Register. That increases the reported volume of healthcare consumption without adding any costs.

Cost per outpatient contact – primary care (D:9)

Visits with various categories of primary caregivers are reported, but not data on diagnosis, age and the like. Thus, the care events and visits are not amenable to weighting in the same way as for specialised care.

We present here a rudimentary weighting of outpatient contacts with the primary care system on the basis of the kind of caregiver involved, as well as whether the visit is at an outpatient clinic or at home.

For instance, visits with caregivers other than doctors are weighted as costing 40 percent of a doctor’s appointment, while a phone consultation is weighted as costing one third of a visit at an outpatient clinic.

Figure D:9 shows cost per weighted outpatient contact with the primary care system in 2006. The figure reveals large regional differences, substantially greater than

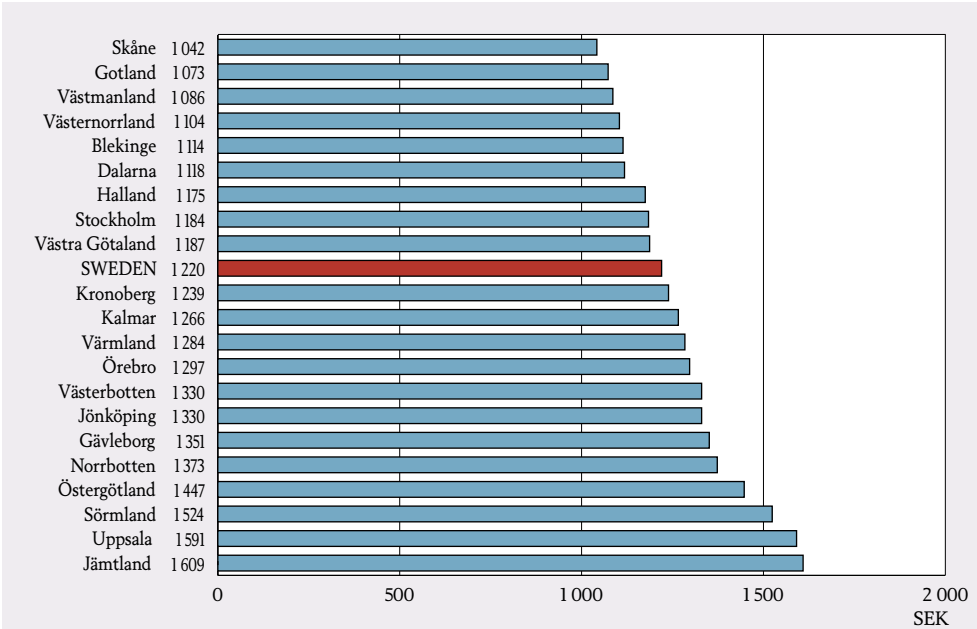


Figure D:9 Cost per visits in primary care, 2006. Weighted vistis. SEK.
Source: The Swedish Association of Local Authorities and Regions

for specialised medical care. The national average is approximately 1 200 kronor per visit. As previously mentioned, reporting of care events and visits in primary care is associated with considerable uncertainty. Thus, the results should be interpreted cautiously.

COST-EFFECTIVE TREATMENT OPTIONS – CHOOSING AMONG EQUIVALENT DRUGS OR BETWEEN DAY-CASE AND INPATIENT SURGERY

Cost-effective treatment options are those that provide equal benefits at lower costs than others. We present two typical examples – choosing among equivalent drugs or between day-case and inpatient surgery.

Costs of prescription drugs rose by about 10 percent annually in the 15 years up to and including 2002. Due to changes in pharmaceutical benefits regulations, primarily the adoption of generic substitution, the rate of increase was very slow since then.

When patent protection on an original drug expires, generics that contain the same active substance but are usually a good deal cheaper may be marketed. If the Swedish Medical Products Agency rules that the generics are equivalent to the original in all respects, pharmacies may substitute one for the other.

Note that the discussion here does not concern the substitution process at pharmacies, but rather the prescribing doctor's choice among various closely related alternatives in a group of drugs. Although these alternative drugs are usually equivalent therapeutically, they cannot replace each other at pharmacies because they contain different substances. Due to price differences, major cost savings are often available by prescribing cheaper alternative drugs.

Percentage of gastric ulcers treated with omeprazole (D:10)

Treatment of gastric ulcers is an area for which several closely related alternatives are available. A new gastric ulcer drug containing esomeprazole was developed several years ago. Esomeprazole is very similar to omeprazole, which is found in Losec – a well-known Swedish drug – and a number of other gastric ulcer medications. Esomeprazole, which is newer, is more than twice as expensive as the omeprazole alternative.

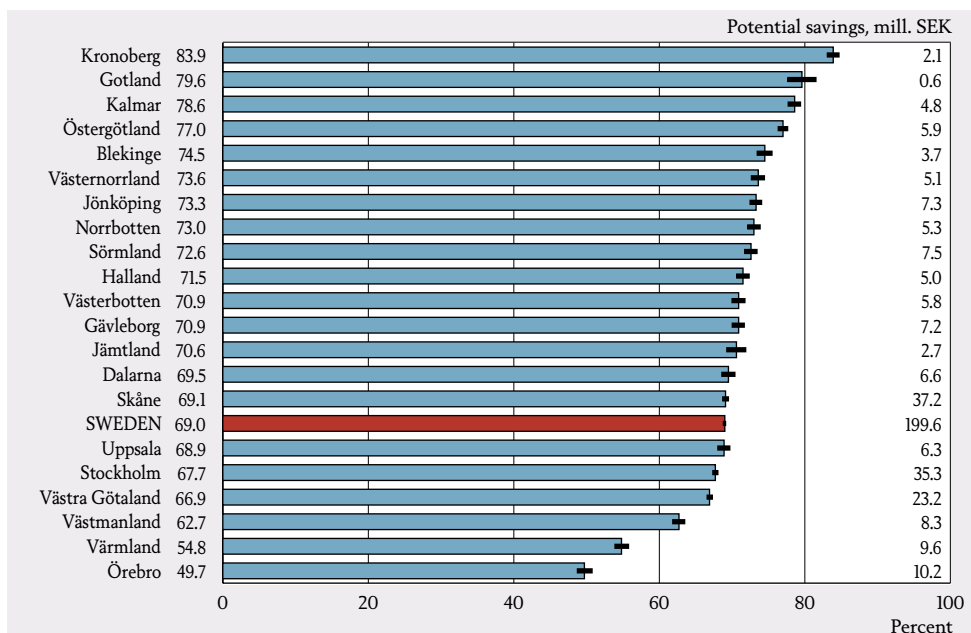


Figure D:10 Proportion of patients with gastric ulcer treated with low-cost drugs (omeprazol), 2006. Percent.

Source: Swedish Prescribed Drug Register,
Centre for Epidemiology / The National Board of Health and Welfare

Using the Prescribed Drug Register, we have examined the prescription of proton pump inhibitors for gastric ulcers and reflux disorders. Omeprazole should be prescribed given that it is cheaper and is deemed to be equally effective as the other preparations in most patients.

Figure D:10 shows the percentage of patients given a prescription for a proton pump inhibitor in 2006 who received omeprazole the first time. To illustrate the financial consequences, a rough and intentionally simple calculation has been performed. How much lower would the annual cost be per region if all patients given a proton pump inhibitor had been prescribed omeprazole instead? The nationwide cost reduction, as shown in the figure, would have been almost 200 million kronor.

The regional variations are relatively large, particularly among those at the top (Värmland, Örebro and Västmanland) and bottom (Kronoberg and Gotland) of the figure.

Percentage of low-cost statins prescribed for lipid lowering therapy (D:11)

The situation is similar for lipid lowering drugs. There are older, cheaper preparations as well as new, more expensive ones with a similar basic substance and without unequivocally greater efficacy. The newer preparations are more than five times as expensive as the older alternatives. We have examined the choice between various high-cost and low-cost statins.

Figure D:11 shows the percentage of patients given a statin prescription in 2006 who received simvastatin or pravastatin the first time. Simvastatin and pravastatin are deemed to be equally effective as the other statins in most patients. Considering that they are considerably cheaper, they should be prescribed. The same simple cost calculation as above has been performed here. If all patients had been prescribed the cheaper alternatives, how much lower would the costs per region have been?

Nationwide, 80 percent of all patients given a statin prescription in 2006 received one of the cheaper alternatives. But the calculation indicates that the regions together would have saved more than 270 million kronor, a very substantial sum, if it had been 100 percent instead. The reasons are the large number of patients treated and the considerably price differences among the drugs.

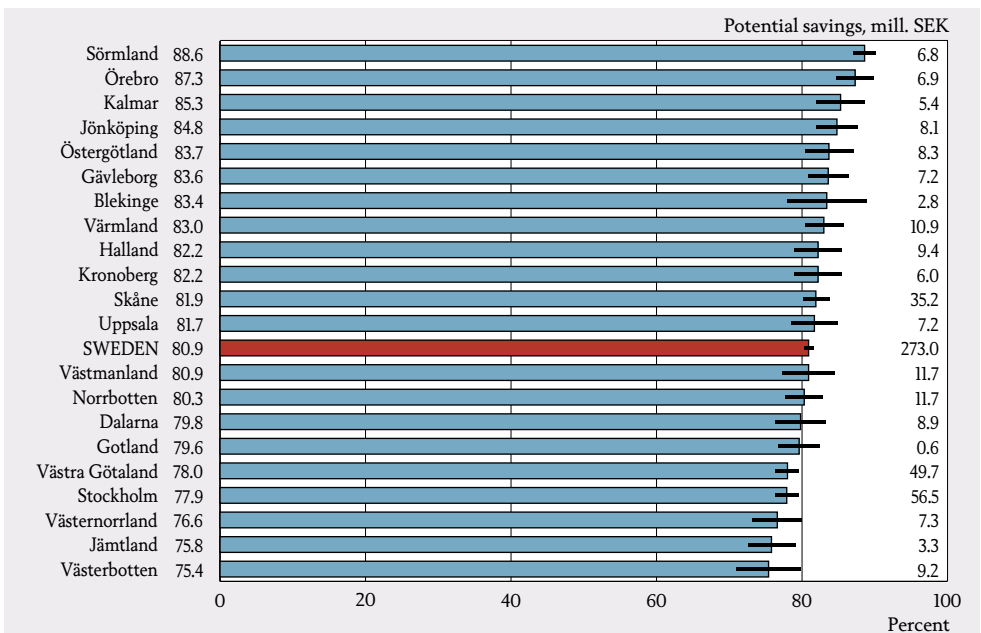


Figure D:11 Percentage of patients on blood lipid lowering drugs treated with low cost statins (pravastatin and simvastatin) 2006. Percent.

Source: Swedish Prescribed Drug Register,
Centre for Epidemiology / The National Board of Health and Welfare

The regional differences were relatively modest – 75-89 percent of patients in each region received simvastatin or pravastatin. Sörmland and Örebro reported very high percentages, i.e., their prescription patterns were particularly cost-effective. That may also be said for the country as a whole given the better than 80 percent nationwide result. Although 100 percent prescription of the low-cost alternatives should not be regarded as a target, many regions would obtain considerable cost savings if their percentages were to increase.

Prolapse of the uterus – percentage of day-case surgery (D:12)

Almost 6 400 Swedish women were operated on for prolapse of the uterus in 2006. Day-case surgery is appropriate assuming that postoperative monitoring is available for enough hours and inpatient resources can be called on when necessary. Prolapse is a broad diagnosis that covers very different severities. Similarly, the operation can be anything from a routine procedure to a major challenge for the surgeon and assistants alike.

Severity, as well as the patient’s age and general condition, all affect the length of the period of care and whether or not day-case surgery is a feasible option. But Fig-

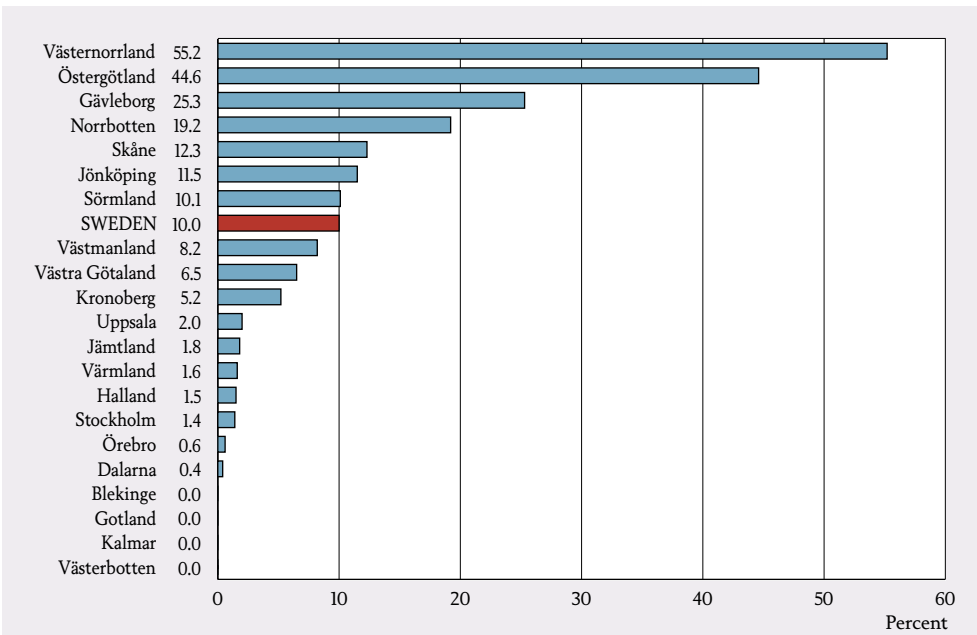


Figure D:12 Uterine prolaps – performed in day surgery, 2006. Percent.
Source: Patient Register, Centre for Epidemiology / The National Board of Health and Welfare

ure A:12 shows that non-patient-related variables also play a large role in determining the percentage who undergo day-case surgery.

The data in the figure are taken from the Patient Register based on each patient's region of domicile. There is no evidence to suggest that the general and health conditions of women differ radically from region to region. One factor that may have some bearing involves the indications and criteria for performing surgery. There are considerable regional differences in the number of women who were operated on in 2006.

The regional variations in the percentage of day-case surgery are so extreme that local tradition and culture undeniably play a significant role. The results are 40 percent for two regions, around 20 percent for two others and 2 percent or less for ten. A safe assumption is that the variations among gynaecology clinics nationwide are even more extreme.

According to the CPP database, day-case surgery averaged 19 400 kronor in 2005, while inpatient surgery averaged 31 200 kronor. A cost estimate based on the ambitious but apparently realistic target that all regions have 40 percent day-case surgery would reduce nationwide costs by more than 20 million kronor

Inguinal hernia – percentage of day-case surgery (D:13)

Inguinal hernia treatment also brings up the question of choosing between day-case and inpatient surgery. The data are taken from the Patient Register for 2006. Almost 16 000 operations were reported to the register. That is an underestimate given that privately performed day-case surgery in Stockholm, as well as regions such as Gotland and Örebro to a lesser extent, is underreported.

Figure D:13 shows the percentage of day-case surgery. The national result was more than 75 percent. The regional variations were neither negligible nor dramatic. The results for four regions were almost 20 percentage points lower than the three regions at the top of the figure.

According to the CPP database, day-case surgery averaged 14 200 kronor and inpatient surgery averaged 22 200 kronor in 2005. If a target were set that all regions have 90 percent day-case surgery, the estimated total cost would decline by 17 million kronor.

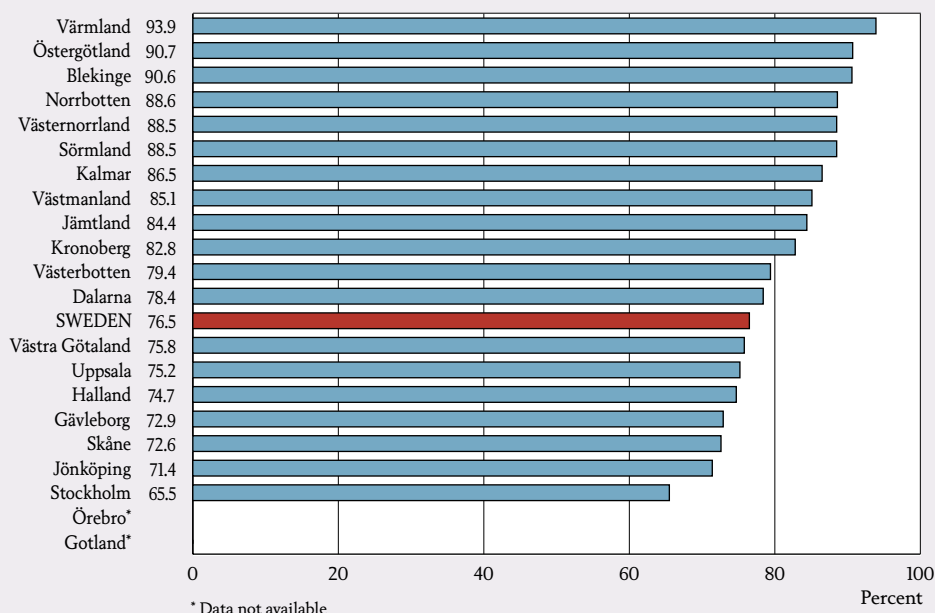


Figure D:13 Inguinal hernia – operations performed in day surgery, 2006. Percent.

Source: Patient Register, Centre for Epidemiology / The National Board of Health and Welfare

Appendix

Description of Indicators

A Medical Results

MORTALITY, HOSPITALISATION AND VACCINATION

A:1 Policy-related avoidable mortality per 100 000 inhabitants

Measure Number of deaths from diseases or accidents that could have been influenced by health policy initiatives

Description The indicator shows the total number of policy-related avoidable deaths per 100 000 inhabitants age 1–74 in 2001–2004.
Policy-related avoidable deaths are those caused by diseases or accidents that could have been influenced by health policy initiatives. The indicator includes deaths caused by lung cancer, oesophageal cancer, cirrhosis of the liver and motor vehicle accidents.

Method of measurement Data on the number of deaths in 2001–2004 were taken from the Cause of Death Register through the following codes.

Cause of death	ICD-9	ICD-10	Age
Lung cancer	162	C34	1–74
Oesophageal cancer	150	C15	1–74
Cirrhosis of the liver	571	K70, K73–K74	1–74
Motor vehicle accidents	E810–823	V codes under Chapter XX that refer to motor vehicle accidents	1–74

The calculations were corrected for regional differences in the age structure of the population. Age-standardised deaths per 100 000 inhabitants were calculated for each region based on the national population in 2001 as the standard. Each death was assigned to the deceased's region of domicile.

The number of deaths was aggregated for several years to increase statistical certainty.
The EU developed the avoidable deaths measure in the mid-1980s. The EU effort produced two atlases that presented regional differences among and within Member States. The measure was later modified and diseases such as oesophageal cancer were added to the policy-related indicators. Moreover, the analysis was limited to the 1–74 age group.

Data sources Cause of Death Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)

Sources of error The data should be interpreted with a certain degree of caution, given that diagnostic methods may vary from region to region. Regions with small populations tend to have less stable results.

A:2 Healthcare-related avoidable mortality per 100 000 inhabitants

Measure	Number of deaths from diseases that could have been influenced by medical interventions
Description	The indicator shows the total number of healthcare-related avoidable deaths per 100 000 inhabitants age 1–74 in 2001–2004. Healthcare-related avoidable deaths are those caused by diseases or accidents that could have been influenced by medical interventions, early detection and treatment. The indicator includes deaths from diseases such as stroke, diabetes and cervical cancer (see complete list below).
Method of measurement	Data on the number of deaths in 2001–2004 were taken from the Cause of Death Register through the following codes.

Cause of death	ICD-9	ICD-10	Age
Tuberculosis	010–018, I37	A15–A19, B90	1–74
Cervical cancer	180	C53	1–74
Hodgkins disease	201	C81	1–74
Chronic rheumatic heart disease	393–398	I05–I09	1–74
Diabetes	250	E10–E14	1–74
Diseases of the respiratory system	460–519	J00–J99	1–14
Asthma	493	J45–J46	1–74
Appendicitis	540–543	K35–K38	1–74
Hernia of the abdominal cavity	550–553	K40–K46	1–74
Gallstones, as well as cholecystitis and other diseases of the gallbladder and biliary tract	574–575.1, 576.1	K80–K81, K83.0	1–74
Hypertensive disease	401–405	I10–I15	1–74
Stroke	430–438	I60–I69	1–74
Complications of pregnancy, childbirth and the puerperium	630–676	O00–O99	
Typhoid fever	002.0	A01.0	1–74
Whooping cough	033	A37	1–14
Tetanus	037	A35	1–74
Osteomyelitis	730	M86–M87	1–74

The calculations were corrected for regional differences in the age structure of the population. Age-standardised deaths per 100 000 inhabitants were calculated for each region based on the national population in 2001 as the standard. Each death was assigned to the deceased's region of domicile.

The number of deaths was aggregated for several years to increase statistical certainty.

The EU developed the avoidable deaths measure in the mid-1980s. The EU effort produced two atlases that presented regional differences among and within Member States. The measure was later modified and diseases such as oesophageal cancer were added to the policy-related indicators.

Data sources	Cause of Death Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
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Sources of error	The data should be interpreted with a certain degree of caution, given that diagnostic methods may vary from region to region. That is particularly true of diabetes. Regions with small populations tend to have less stable results.
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A:3 Avoidable hospitalisations per 100 000 inhabitants

Measure	Number of avoidable hospitalisations per 100 000 inhabitants in 2004–2006
Description	The indicator includes avoidable hospitalisations caused by selected diseases. The first group of selected diagnoses were those that primarily illustrate how well outpatient care handles chronic or long-term conditions. The second group of selected diagnoses were several acute conditions for which proper treatment within a reasonable period of time could avert hospitalisation. The indicator shows patients with avoidable hospitalisations per 100 000 inhabitants by region in 2004–2006.
Method of measurement	The calculations were corrected for regional differences in the age structure of the population. Data were age-standardised based on the national population in 2000 as the standard. Each hospitalisation was assigned to the deceased's region of domicile. The indicator includes the following diseases in accordance with ICD-10:

Diagnosis	ICD-10
<i>Chronic conditions</i>	
Anaemia	D501, D508, D509
Asthma	J45, J46
Diabetes	E101–E108 (primary or secondary diagnosis) E110–E118 (primary or secondary diagnosis) E130–E138 (primary or secondary diagnosis) E140–E148 (primary or secondary diagnosis)
Heart failure	I50, I110, J81
Hypertension	I10, I119
Chronic obstructive lung disease	J41, J42, J43, J44, J47 (primary diagnosis) J20, along with J41, J42, J43, J44, J47 as secondary diagnosis
Angina pectoris	I20, I240, I248, I249
<i>Acute conditions</i>	
Bleeding ulcer	K250, K251, K252, K254, K255, K256, K260, K261, K262, K264, K265, K266, K270, K271, K272, K274, K275, K276, K280, K281, K282, K284, K285, K286
Diarrhoea	E86, K522, K528, K529
Epileptic seizures	O15, G40, G41, R56
Inflammatory diseases of female pelvic organs	N70, N73, N74
Pyelitis	N390, N10, N11, N12, N136
Ear, nose and throat infection	H66, H67, J02, J03, J06, J312

Data sources	Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	Because the occurrence of certain conditions, and possibly the diagnostic methods used, varies from region to region, differences in avoidable hospitalisation should be interpreted with a degree of caution.

A:4 Vaccination of children – measles, mumps, rubella (MMR)

Measure	Percentage of children vaccinated against measles, mumps and rubella
Description	Combined measles, mumps, rubella (MMR) vaccine <i>Numerator:</i> Number of children born in 2004 who had received the MMR vaccine at least once by January 2007 <i>Denominator:</i> Total number of children born in 2004
Method of measurement	MMR vaccination data are kept by the paediatric care system (child health centre case notes) and collected by the Swedish Institute for Infectious Disease Control. The data refer to vaccination status in January 2007. The number of vaccinated children was compared per region to the total number of children born in 2004 who were entered in the population register according to Statistics Sweden.
Data sources	Swedish Institute for Infectious Disease Control
Sources of error	The basic data were of good quality and had a high participation rate.

A:5 Vaccination of people age 65 and older – influenza

Measure	Percentage of people age 65 and older, vaccinated against influenza
Description	<i>Numerator:</i> Number of people age 65 and older, per region vaccinated against influenza during the winter of 2006–2007 <i>Denominator:</i> Number of people age 65 and older, in each region
Method of measurement	Data were collected from the infectious disease control units of each region. The data consist of assessments made with various methods and documentation in the various regions – questionnaires for selection of people age 65 and older, estimates by means of vaccine supply, registration in primary care, etc.
Data sources	Infectious disease control units of the various regions
Sources of error	The absence of a uniform method to calculate and assess the number of vaccinations given to people age 65 and older, is a very large source of uncertainty.

A:6 MRSA infection per 100 000 inhabitants

Measure	Number of MRSA infections per 100 000 inhabitants
Description	Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) bacteria are resistant to methicillin, the antibiotic normally prescribed for <i>Staphylococcus</i> infections. The indicator presents the average number of newly detected MRSA infections per 100 000 inhabitants of each region in 2005–2006. The indicator includes only people who were infected in Sweden, whether at healthcare facilities or in the community.
Method of measurement	The occurrence of MRSA is subject to reporting, and all regions report newly detected cases to the Swedish Institute for Infectious Disease Control. Thus, the data are presented based on the region where the infection was reported or diagnosed rather than the person's domicile or whereabouts when infected.

Data sources	Swedish Institute for Infectious Disease Control
Sources of error	In addition to the actual number of people infected, the regional differences may reflect variables such as how often doctors suspect infection and take a culture.

DRUG CONSUMPTION

A:7 Polypharmacy – elderly who consume ten or more drugs

Measure	Percentage of people age 80 and older who consume ten or more drugs concurrently
Description	<i>Numerator:</i> People age 80 and older who consumed ten or more drugs concurrently in October–December 2006 <i>Denominator:</i> Total population age 80 and over in October–December 2006
Method of measurement	A current list of drugs was made for each person. Based on data extracted from the Prescribed Drug Register for the previous three months concerning date, quantity and dosage of each prescription picked up, drug consumption was estimated for October–December 2006. Calculating the prescribed dosage requires interpreting instructions that currently are entered in the register as comments only. Certain assumptions had to be made sometimes when data about dosage were incomplete or unavailable. The Prescribed Drug Register contains all individual data concerning prescriptions that have been picked up under the pharmaceutical benefits scheme, i.e., as part of outpatient care. Each prescription was assigned to the patient's region of domicile.
Data sources	Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	Because the Prescribed Drug Register does not include drugs prescribed in inpatient care, dispensed from a drug storehouse or bought on a non-prescription basis, consumption among the elderly may be understated. Given that the register contains data only for drugs picked up from a pharmacy, the reported quantity prescribed may be low. The method of estimating current drug consumption entails a certain degree of uncertainty, particularly in terms of interpreting dosage instructions.

A:8 Polypharmacy – elderly who consume three or more psychopharmacological drugs

Measure	Percentage of people age 80 and older who consume three or more psychopharmacological drugs concurrently
Description	The indicator presents concurrent therapy with three or more psychopharmacological drugs, whether routinely or on demand. <i>Numerator:</i> People age 80 and over who consumed three or more pharmacological drugs concurrently in October–December 2006 <i>Denominator:</i> Total population age 80 and older in October–December 2006
Method of measurement	See Indicator A:7

Data sources	Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	See Indicator A:7

A:9 Drug-drug interactions that should be avoided in the elderly

Measure	Percentage of people age 80 and older who use drugs that pose the risk of Class D drug-drug interactions
Description	Drug-drug interactions may arise from the concurrent consumption of certain combinations of drugs. Class C and D interactions (the latter of which is the more serious) are the clinically relevant drug-drug interactions. According to FASS (the Swedish equivalent of the Physicians' Desk Reference), a Class D interaction "can lead to serious clinical consequences in terms of severe side-effects or lack of efficacy, or may otherwise be difficult to control with individual doses." <i>Numerator:</i> People age 80 and over who consumed drugs in October-December 2006 that posed a risk of Class D drug-drug interactions <i>Denominator:</i> Total population age 80 and older in October-December 2006
Method of measurement	See Indicator A:7
Data sources	Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	See Indicator A:7

A:10 Fluoroquinolone therapy for urinary tract infection in women

Measure	Percentage of women receiving quinolone therapy for urinary tract infection
Description	Quinolones are the broad-spectrum antibiotics of ciprofloxacin and norfloxacin. The indicator includes women age 18–64 who picked up an initial prescription sometime in 2006 for one of the two drugs. <i>Numerator:</i> Number of women age 18–64 who picked up an initial prescription for quinolones sometime in 2006 <i>Denominator:</i> Total number of women who picked up a prescription in 2006 to treat urinary tract infection consisting of one of the following drugs: ciprofloxacin, norfloxacin, pivmecillinam, trimetoprim or nitrofurantoin
Method of measurement	Data were age-standardised, i.e., calculations were corrected for regional differences in the age structure of the population. Each prescription was assigned to the patient's region of domicile.

Drug	ATC code
Ciprofloxacin	J01MA02
Norfloxacin	J01MA06
Pivmecillinam	J01CA08

Drug	ATC code
Trimetoprim	J01EA01
Nitrofurantoin	J01XE01

Data sources	Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	The Prescribed Drug Register has no data on the indication for which the drug was prescribed. Because quinolones in particular may be prescribed for indications other than lower urinary tract infection, their percentage is overstated.

CANCER SURVIVAL RATE

A:11 Breast cancer – relative five-year survival rates

Measure	Relative five-year survival rates for women diagnosed with breast cancer
Description	The indicator shows relative five-year survival rates for women age 89 and younger who were first diagnosed with breast cancer in 1999–2005. Relative means that the rates represent a comparison with expected survival of people who had not been diagnosed with cancer. Survival was monitored up to and including December 2005.
Method of measurement	Data on the number of women with breast cancer were taken from the National Cancer Registry in accordance with ICD-10 code C50. The relative method calculates survival after diagnosis using population-based cancer registers. Relative survival is the ratio between observed survival in the group that developed cancer and the expected survival of a population that is comparable in terms of the primary factors (gender, age and period of time in this case) that influence survival. A relative five-year survival rate of 50 percent indicates that half of the patients would have been alive after five years if breast cancer had been the only possible cause of death. The calculations took any regional differences in average life expectancy into consideration. Patients were assigned to their region of domicile. In order to increase the number of patients with follow-up of at least five years, the last seven available years of diagnosis were used.
Data sources	National Cancer Registry, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	The National Cancer Registry is well established and has mandatory reporting. The basic data are of excellent quality.

A:12 Colon cancer – relative five-year survival rates

Measure	Relative five-year survival rates for patients diagnosed with colon cancer
Description	The indicator shows relative five-year survival rates for patients age 89 and younger who were first diagnosed with colon cancer in 1999–2005. Relative means that the rates represent a comparison with expected survival of people who had not been diagnosed with cancer. Survival was monitored up to and including December 2005.

Method of measurement	Data on the number of patients with colon cancer were taken from the National Cancer Registry in accordance with ICD-10 codes C18 and C19. The relative method calculates survival after diagnosis using population-based cancer registers. Relative survival is the ratio between observed survival in the group that developed cancer and the expected survival of a population that is comparable in terms of the primary factors (gender, age and period of time in this case) that influence survival. A relative five-year survival rate of 50 percent indicates that half of the patients would have been alive after five years if colon cancer had been the only possible cause of death. The calculations took any regional differences in average life expectancy into consideration. Patients were assigned to their region of domicile. In order to increase the number of patients with follow-up of at least five years, the last seven available years of diagnosis were used. Although colon and rectal cancer are commonly grouped together as colorectal cancer, their survival rates are presented separately here because of differences with respect to treatment and other factors.
Data sources	National Cancer Registry, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	The National Cancer Registry is well established and has mandatory reporting. The basic data are of excellent quality. Although the calculation used patients from seven years of diagnosis, survival rates in regions with small populations were based on a limited number of patients. Random variations may thereby have influenced observed regional differences, as reflected in the wide confidence intervals.

A:13 Rectal cancer – relative five-year survival rates

Measure	Relative five-year survival rates for patients diagnosed with rectal cancer
Description	The indicator shows relative five-year survival rates for patients age 89 and younger who were first diagnosed with rectal cancer in 1999–2005. Relative means that the rates represent a comparison with expected survival of people who had not been diagnosed with cancer. Survival was monitored up to and including December 2005.
Method of measurement	Data on the number of patients with rectal cancer were taken from the National Cancer Registry in accordance with ICD-10 codes C20 and C21. The relative method calculates survival after diagnosis using population-based cancer registers. Relative survival is the ratio between observed survival in the group that developed cancer and the expected survival of a population that is comparable in terms of the primary factors (gender, age and period of time in this case) that influence survival. A relative five-year survival rate of 50 percent indicates that half of the patients would have been alive after five years if rectal cancer had been the only possible cause of death. The calculations took any regional differences in average life expectancy into consideration. Patients were assigned to their region of domicile. In order to increase the number of patients with follow-up of at least five years, the last seven available years of diagnosis were used. Although colon and rectal cancer are commonly grouped together as colorectal cancer, their survival rates are presented separately here because of differences with respect to treatment and other factors.

Data sources	National Cancer Registry, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	The National Cancer Registry is well established and has mandatory reporting. The basic data are of excellent quality. Although the calculation used patients from seven years of diagnosis, survival rates in regions with small populations were based on a limited number of patients. As a result, random variations may have influenced observed regional differences.

A:14 Rectal cancer – reoperation within 30 days

Measure	Percentage of reoperations within 30 days after primary surgery for rectal cancer
Description	<i>Numerator:</i> Number of reoperations performed in 2001-2005 within 30 days after primary surgery for rectal cancer <i>Denominator:</i> Total number of primary surgical procedures in 2001-2005 reported to the Swedish Rectal Cancer Registry Surgery refers to anterior resection, abdomino-perineal resection or Hartmann procedure.
Method of measurement	Data were not corrected for patient mix. Both data collection and reporting are under the auspices of oncological centres, and the register has a high participation rate. Patients were assigned to the region in which the hospital was located rather than where they lived.
Data sources	Swedish Rectal Cancer Registry
Sources of error	In addition to actual differences, regional variations may be due to data entry discrepancies.

A:15 Prostate cancer – active treatment of patients younger than age 65

Measure	Percentage of patients who received active treatment for localised prostate cancer
Description	The indicator measures the percentage of patients who received active treatment, i.e., radical prostatectomy or radiotherapy. The main alternative to active treatment is watchful waiting. <i>Numerator:</i> Number of men age 65 and younger who received active treatment for localised prostate cancer in 2005 <i>Denominator:</i> Total number of men age 65 and younger who had localised prostate cancer in 2005 according to the National Prostate Cancer Registry
Method of measurement	Data were collected by the National Prostate Cancer Registry. The registry has a high participation rate. Treatment was assigned to the region in which the clinic was located rather than where the patient lived.
Data sources	National Prostate Cancer Registry
Sources of error	Possible reporting and data entry flaws may be sources of error.

MATERNAL AND NEONATAL CARE

A:16 Induced abortion, both medical and surgical, prior to the 9th week of pregnancy

Measure	Percentage of induced abortions, broken down by medical and surgical, prior to the 9th week of pregnancy
Description	A medical abortion involves administering two rounds of drugs 2–3 days apart. Surgical abortion involves evacuation of the uterus under local or general anaesthesia. The data include induced abortions performed prior to the 9th week of pregnancy in 2004–2006. <i>Numerator:</i> Number of induced abortions, broken down by medical and surgical, performed prior to the 9th week of pregnancy in 2004–2006 <i>Denominator:</i> Total number of abortions performed in 2004–2006
Method of measurement	Each abortion was assigned to the woman's region of domicile. Anonymised data on abortions that have been performed are reported to the NBHW, primarily by gynaecology clinics and gynaecology departments at hospitals. The NBHW has a record of all legal abortions performed in Sweden since 1975.
Data sources	Abortion statistics, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	The basic data are of good quality.

A:17 Foetal mortality rate per 1 000 births

Measure	Foetal mortality rate per 1 000 births
Description	Foetal mortality is defined as the birth of a child without any signs of life after the 28th week of pregnancy. Foetal death may occur prior to or (the rarer case) during childbirth. Foetal mortality was calculated per 1 000 births for each region in 2001–2005.
Method of measurement	The calculations were corrected for regional differences in the age structure of the population. Data were age-standardised based on all women who gave birth in 2001–2005 as the standard population. Each delivery was assigned to the woman's region of domicile. Hospitals report foetal mortality data to the NBHW on an annual basis.
Data sources	Medical Birth Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	Dropout in reporting to the Medical Birth Registry is an estimated 0.5–3 percent per year but is somewhat higher for neonatal deaths. The register data may be inadequate for many different reasons. Case notes may be insufficiently documented, proper diagnoses may have been missed, or diagnoses and other key data may have been left out of the case notes. Data may be in the case notes but not the documentation that is subsequently sent for entry and storage.

A:18 Neonatal mortality rate per 1 000 live births

Measure	Neonatal mortality rate within 28 days per 1 000 live births
Description	The neonatal mortality rate measures the number of children who die within 28 days after birth. Neonatal mortality was calculated per 1 000 live births for each region in 2001–2005.
Method of measurement	The calculations were corrected for regional differences in the age structure of the population. Data were age-standardised based on all women who gave birth in 2001–2005 as the standard population. Each delivery was assigned to the woman's region of domicile.
Data sources	Medical Birth Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	Dropout in reporting to the Medical Birth Registry is an estimated 0.5–3 percent per year but is somewhat higher for neonatal deaths. See Indicator A:17 for conceivable causes of dropout.

A:19 Percentage of newborns with Apgar score under 7

Measure	Percentage of newborns with Apgar score under 7 at five minutes
Description	The Apgar score (with a maximum of 10) is a system for standardised assessment of the vitality of newborns. A score below 7 at five minutes is defined as low. Numerator: Number of newborns in 2001–2005 with Apgar scores below 7 five minutes after birth Denominator: Total live births in 2001–2005
Method of measurement	The calculations were corrected for regional differences in the age structure of the population. Data were age-standardised based on all women who gave birth in 2001–2005 as the standard population. Each delivery was assigned to the woman's region of domicile. The newborn's heart rate, breathing, skin colouration, activity and muscle tone, and reflex irritability were rated on a scale of 0–2 at one minute, five minutes and ten minutes after birth.
Data sources	Medical Birth Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	Dropout in reporting to the Medical Birth Registry is an estimated 0.5–3 percent per year but is somewhat higher for neonatal deaths. See Indicator A:17 for conceivable causes of dropout.

A:20 Third and fourth degree perineal tear during vaginal delivery

Measure	Percentage of third and fourth degree perineal tear during vaginal delivery
Description	Perineal tear is a rupture that can occur during childbirth in the soft tissues between the vaginal opening and anus. Perineal tears are classified according to their scope, 3rd and 4th degree being the most extensive. <i>Numerator:</i> Number of vaginal deliveries in 2001–2005 that gave rise to 3rd or 4th degree perineal tears <i>Denominator:</i> Total number of vaginal deliveries in 2001–2005
Method of measurement	The calculations were corrected for regional differences in the age structure of the population. Data were age-standardised based on all women who gave birth in 2001–2005 as the standard population. Each delivery was assigned to the woman's region of domicile.
Data sources	Medical Birth Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	Dropout in reporting to the Medical Birth Registry is an estimated 0.5–3 percent per year but is somewhat higher for neonatal deaths. See Indicator A:17 for conceivable causes of dropout.

DIABETES CARE

A:21 Diabetic patients in primary care who reach the goal for HbA1c levels

Measure	Diabetic patients in primary care who reach the goal for HbA1c levels
Description	HbA1c is a test that measures blood sugar levels in the blood. The treatment goal was an HbA1c level of 6 percent or below. <i>Numerator:</i> Number of diabetic patients of all ages in primary care who reached the goal for blood sugar levels of the National Diabetes Register in 2006 <i>Denominator:</i> Total number of diabetic patients reported to the National Diabetes Register in 2006
Method of measurement	The National Diabetes Register (NDR) collects data on diabetes care from both medical and primary care clinics. Although the register has a participation rate of approximately 43, the regional variations are substantial. The figure also presents the participation rate for each region. Each patient was assigned to the region where treatment was administered. The treatment goals are consistent with the targets and guidelines issued by the Swedish Association for Diabetology and used by the NDR.
Data sources	National Diabetes Register (NDR)
Sources of error	The main source of error stems from the relatively low and varying participation rates of different regions in the NDR.

A:22 Diabetic patients in primary care who reach the blood pressure goal

Measure	Percentage of diabetic patients in primary care who reach the blood pressure goal
Description	The treatment goal is defined as blood pressure equal to or lower than 130/80 mm Hg. The indicator includes all patients, whether or not they were treated for hypertension. <i>Numerator:</i> Number of diabetic patients of all ages in primary care who reached the blood pressure goal of the National Diabetes Register in 2006 <i>Denominator:</i> Total number of diabetic patients reported to the National Diabetes Register in 2006
Method of measurement	See Indicator A:21
Data sources	National Diabetes Register (NDR)
Sources of error	See Indicator A:21

A:23 Diabetic patients receiving antihypertensive therapy

Measure	Percentage of diabetic patients receiving antihypertensive therapy								
Description	The number of diabetics receiving drug therapy is based on the Prescribed Drug Register and includes all those who picked up at least one prescription for a diabetes drug in 2006. The percentage of those patients who picked up an antihypertensive prescription was studied. Those who picked up ACE inhibitors or Angiotension II antagonists were reported separately. <i>Numerator:</i> Number of diabetics age 18 and older receiving drug therapy who picked up at least one antihypertensive prescription in 2006 according to the Prescribed Drug Register <i>Denominator:</i> Total number of diabetics age 18 and older receiving drug therapy in 2006 according to the Prescribed Drug Register								
Method of measurement	Data were age-standardised, i.e., calculations were corrected for regional differences in the age structure of the population. Each prescription was assigned to the patient's region of domicile. <table border="1"><thead><tr><th>Drug</th><th>ATC code</th></tr></thead><tbody><tr><td>Diabetes drugs</td><td>A10</td></tr><tr><td>Antihypertensive drugs</td><td>C02, C03, C07, C08, C09</td></tr><tr><td>ACE inhibitors, Angiotension II antagonists</td><td>C09</td></tr></tbody></table>	Drug	ATC code	Diabetes drugs	A10	Antihypertensive drugs	C02, C03, C07, C08, C09	ACE inhibitors, Angiotension II antagonists	C09
Drug	ATC code								
Diabetes drugs	A10								
Antihypertensive drugs	C02, C03, C07, C08, C09								
ACE inhibitors, Angiotension II antagonists	C09								
Data sources	Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)								
Sources of error	The Prescribed Drug Register captures only diabetics who are prescribed tablets or insulin, not those who receive nutritional therapy only. The Prescribed Drug Register has no data on the indication for which the drug was prescribed. Many of the other drugs may be prescribed for indications other than hypertension. Thus, the indicator does not directly measure the number of diabetics with hypertensive disease.								

A:24 Diabetic patients treated with blood lipid lowering drugs

Measure	Percentage of diabetic patients treated with blood lipid lowering drugs						
Description	The number of diabetics receiving drug therapy is taken from the Prescribed Drug Register and includes all those who picked up at least one prescription for a diabetes drug in 2006. The percentage of those patients who picked up a prescription for a blood lipid lowering drug was studied. <i>Numerator:</i> Number of diabetics age 40 and older receiving drug therapy who picked up at least one prescription for a blood lipid lowering drug in 2006 <i>Denominator:</i> Total number of diabetics age 40 and older receiving drug therapy in 2006 according to the Prescribed Drug Register						
Method of measurement	Data were age-standardised, i.e., calculations were corrected for regional differences in the age structure of the population. Each prescription was assigned to the patient's region of domicile. <table><tr><th>Drug</th><th>ATC code</th></tr><tr><td>Diabetes drugs</td><td>A10</td></tr><tr><td>Blood lipid lowering drugs</td><td>C02, C03, C07, C08, C09</td></tr></table>	Drug	ATC code	Diabetes drugs	A10	Blood lipid lowering drugs	C02, C03, C07, C08, C09
Drug	ATC code						
Diabetes drugs	A10						
Blood lipid lowering drugs	C02, C03, C07, C08, C09						
Data sources	Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)						
Sources of error	The Prescribed Drug Register captures only diabetics who are prescribed tablets or insulin, not those who receive nutritional therapy only. The register has no data on the indication for which the drug was prescribed.						

STROKE CARE

A:25 Stroke – 28-day case fatality rate

Measure	Percentage of patients who die within 28 days after first-time stroke
Description	A first-time stroke is one that occurs when the patient has not had been diagnosed with a stroke for the previous seven years of the Patient Register. All other patients were excluded from the calculation. Stroke refers to cerebral haemorrhage, cerebral infarction or unspecified stroke. All care events associated with a diagnosis of stroke in 2002–2004 in the inpatient section of the Patient Register or a death caused by a stroke during the previous 28 days were assigned to a stroke case. Both hospitalised and non-hospitalised patients were included. The 28-day case fatality rate was measured on the basis of the Cause of Death Register, which contains data for everyone who has died. <i>Numerator:</i> Number of first-time stroke patients who died within 28 days after stroke <i>Denominator:</i> Total number of patients who had first-time strokes in 2002–2004

Method of measurement The percentage of deaths within 28 days after stroke was age-standardised based on all stroke cases in 2000 as the standard population. The same standard population was used for women and men.

Diagnosis	ICD-10 code
Stroke	I61, I63, I64

Patients were assigned to their region of domicile.

Data sources Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Cause of Death Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)

Sources of error There was very little dropout of personal identity numbers in either the inpatient section of the Patient Register or in the Cause of Death Register. Variations in diagnostic criteria among the different regions may have influenced the results.

A:26 Stroke – 28-day case fatality rate – hospitalised patients

Measure Percentage of patients who are hospitalised and who die within 28 days after first-time stroke

Description Stroke refers to cerebral haemorrhage, cerebral infarction or unspecified stroke. A first-time stroke is one that occurs when the patient has not had been diagnosed with a stroke for the previous seven years of the Patient Register.
All care events associated with a diagnosis of stroke in 2004–2006 in the inpatient section of the Patient Register during the previous 28 days were assigned to a stroke case.
The 28-day case fatality rate is measured on the basis of the Cause of Death Register, which contains data for everyone who has died.
Numerator: Number of first-time stroke patients who were hospitalised and who died within 28 days after stroke
Denominator: Total number of patients who were hospitalised after first-time stroke in 2004–2006

Method of measurement The percentage of deaths within 28 days after stroke was age-standardised based on all stroke cases in 2000 as the standard population. The same standard population was used for women and men.

Diagnosis	ICD-10 code
Stroke	I61, I63, I64

Patients were assigned to their region of domicile.

Data sources Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Cause of Death Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)

Sources of error There was very little dropout of personal identity numbers in either the inpatient section of the Patient Register or in the Cause of Death Register. Variations in diagnostic criteria among the different regions may have influenced the results.

A:27 Patients treated at a special stroke unit

Measure	Percentage of stroke patients treated at a special stroke unit in 2006
Description	The indicator includes special stroke units that were well functioning according to specified criteria. A special stroke unit is an organised inpatient care centre that exclusively (or almost exclusively) treats stroke patients and that is run by an interdisciplinary team of stroke experts. For more details, refer to the National Guidelines for Stroke Care. <i>Numerator:</i> All stroke patients who were treated at a well functioning special stroke unit in 2006 <i>Denominator:</i> All stroke patients entered in the National Quality Register for Stroke in 2006
Method of measurement	The National Quality Register for Stroke collects data about patient status at the time of stroke, during hospitalisation and during 3-month follow-up. All acute care hospitals, and certain other units, that treat stroke patients participate. Treatment was assigned to the region in which the clinic was located rather than where the patient lived.
Data sources	National Quality Register for Stroke
Sources of error	One source of error may have been regional variations in the participation rate, i.e., not all stroke patients were entered in the National Quality Register for Stroke. Another source of error may have been that a unit that failed to meet the criteria was included.

A:28 Activities of daily living (ADL) ability three months after stroke

Measure	Percentage of stroke patients who are dependent on others for their personal ADLs three months after the acute phase
Description	Personal ADLs refer to locomotion, toileting, dressing and undressing. <i>Numerator:</i> Number of stroke patients in 2006 who were dependent on others for all of their personal ADLs three months after the acute phase <i>Denominator:</i> All stroke patients entered in the National Quality Register for Stroke in 2006 who had been independent of others for their personal ADLs, prior to their stroke.
Method of measurement	The National Quality Register for Stroke collects data about patient status at the time of stroke, during hospitalisation and during 3-month follow-up. All acute care hospitals, and certain other units, that treat stroke patients participate. Treatment was assigned to the region in which the clinic was located rather than where the patient lived. Data were based on the same statistics as in the National Quality Register for Stroke report, but the percentages may have differed depending on how dropout was handled.

Data sources	National Quality Register for Stroke
Sources of error	The reported data do not cover all Swedish stroke patients. Dropout occurs in connection with participation in the register, the 3-month follow-up period and responses to individual questions during follow-up. Interpreting dependence on others for the various ADLs is also associated with a certain degree of uncertainty.

A:29 Anticoagulant therapy after stroke

Measure	Percentage of stroke patients with atrial fibrillation who are given anticoagulant therapy										
Description	Stroke patients are those whose primary diagnosis was stroke (cerebral infarction). The indicator includes patients whose primary diagnosis was stroke and whose secondary diagnosis was atrial fibrillation. Patients were regarded as having been given anticoagulant therapy if they picked up a prescription for Waran. <i>Numerator:</i> Number of stroke patients of all ages with atrial fibrillation in 2005–2006 who picked up an anticoagulant prescription at some point between 1 January and 30 June 2007 <i>Denominator:</i> Total number of patients who had at least one care event with stroke as the primary diagnosis and atrial fibrillation as the secondary diagnosis in 2005–2006										
Method of measurement	Data on the number of patients with stroke as the primary diagnosis and atrial fibrillation as the secondary diagnosis were taken from the inpatient section of the Patient Register. The population includes people who had at least one care event in 2005–2006 and who were alive on 30 June 2007. Data were taken from the Prescribed Drug Register concerning anticoagulant (Waran) prescriptions that these people picked up between 1 January and 30 June 2007. <table> <tr> <th>Diagnosis</th><th>ICD-10 code</th></tr> <tr> <td>Stroke</td><td>I63, I64</td></tr> <tr> <td>Atrial fibrillation</td><td>I48</td></tr> <tr> <th>Drug</th><th>ATC code</th></tr> <tr> <td>Waran</td><td>B01AA03</td></tr> </table>	Diagnosis	ICD-10 code	Stroke	I63, I64	Atrial fibrillation	I48	Drug	ATC code	Waran	B01AA03
Diagnosis	ICD-10 code										
Stroke	I63, I64										
Atrial fibrillation	I48										
Drug	ATC code										
Waran	B01AA03										

The percentages were not age-standardised. Each care event was assigned to the patient's region of domicile at the time.

Data sources	Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW) Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	There was very little dropout of personal identity numbers in the inpatient section of the Patient Register. Variations in diagnostic criteria among the different regions may have influenced the size of the stroke population. Because the Prescribed Drug Register does not include drugs dispensed from a drug storehouse in an assisted living facility or bought on a non-prescription basis, consumption among the elderly may be understated. Given that the register contains data only for drugs picked up from a pharmacy, the reported quantity prescribed may be low.

A:30 Stroke – readmission within 365 days

Measure	Percentage of patients readmitted to inpatient care after stroke within 365 days				
Description	Stroke refers to a consecutive care episode with stroke as the initial primary diagnosis. Only first-time cases were monitored, i.e., when the patient had not had been diagnosed with a stroke for the previous seven years of the Patient Register. A patient was regarded as having been readmitted when the primary diagnosis was stroke or the late effects of stroke. Readmissions were counted only once regardless of how many times the patient was readmitted during the 365-day period. <i>Numerator:</i> Number of patients who were readmitted to inpatient care at least once within 365 days with stroke or the late effects of stroke as the primary diagnosis <i>Denominator:</i> Number of estimated first-time care events with stroke as the primary diagnosis				
Method of measurement	The percentage of readmissions within 365 days after stroke was age-standardised based on all stroke cases in 2000 as the standard population. <table border="1"><thead><tr><th>Diagnosis</th><th>ICD-10 code</th></tr></thead><tbody><tr><td>Stroke</td><td>I61, I63, I64, I69</td></tr></tbody></table> Patients were assigned to their region of domicile.	Diagnosis	ICD-10 code	Stroke	I61, I63, I64, I69
Diagnosis	ICD-10 code				
Stroke	I61, I63, I64, I69				
Data sources	Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)				
Sources of error	There was very little dropout of personal identity numbers in the inpatient section of the Patient Register. Variations in diagnostic criteria among the different regions may have influenced the results.				

CARDIAC CARE

A:31 Myocardial infarction – 28-day case fatality rate

Measure	Percentage of patients who die within 28 days after myocardial infarction
Description	All care events with a diagnosis of acute myocardial infarction in the inpatient section of the Patient Register or a death caused by myocardial infarction during the previous 28 days were assigned to a case of acute myocardial infarction. The indicator also includes patients who were not hospitalised. The 28-day case fatality rate is measured on the basis of the Cause of Death Register, which contains data for everyone who has died. <i>Numerator:</i> Number of first-time cases who died within 28 days after myocardial infarction <i>Denominator:</i> Total number of patients who had myocardial infarctions in 2002–2004

Method of measurement The percentage of deaths within 28 days after myocardial infarction was age-standardised based on all acute myocardial infarction cases in 2000 as the standard population. The same standard population was used for women and men.

Diagnosis	ICD-10 code
Myocardial infarction	I21, I22

Patients were assigned to their region of domicile.

Data sources Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Cause of Death Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)

Sources of error There was very little dropout of personal identity numbers in either the inpatient section of the Patient Register or in the Cause of Death Register. Variations in diagnostic criteria among the different regions may have influenced the results.

A:32 Myocardial infarction – 28-day case fatality rate – hospitalised patients

Measure Percentage of patients who are hospitalised and who die within 28 days after first-time myocardial infarction

Description All care events with a diagnosis of acute myocardial infarction in the inpatient section of the Patient Register during the previous 28 days were assigned to a case of acute myocardial infarction.

The 28-day case fatality rate is measured on the basis of the Cause of Death Register, which contains data for everyone who has died.

Numerator: Number of first-time cases who were hospitalised and who died within 28 days after myocardial infarction

Denominator: Total number of patients who were hospitalised after first-time myocardial infarction in 2004–2006

Method of measurement The percentage of deaths within 28 days after myocardial infarction was age-standardised based on all acute myocardial infarction cases in 2000 as the standard population. The same standard population was used for women and men.

Diagnosis	ICD-10 code
Myocardial infarction	I21, I22

Patients were assigned to their region of domicile.

Data sources Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Cause of Death Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)

Sources of error There was very little dropout of personal identity numbers in either the inpatient section of the Patient Register or in the Cause of Death Register. Variations in diagnostic criteria among the different regions may have influenced the results.

A:33 Reperfusion therapy for patients with ST-segment elevation myocardial infarction

Measure	Percentage of patients who received reperfusion therapy for ST-segment elevation myocardial infarction in 2006
Description	The indicator covers all patients who had ST-segment elevation myocardial infarction (STEMI) or left bundle branch block (LBBB) upon arrival at intensive care. Reperfusion therapy includes primary percutaneous coronary intervention (PCI), thrombolysis therapy and coronary artery bypass graft (CABG) surgery. <i>Numerator:</i> Number of patients younger than 80 per region with STEMI or LBBB who received acute reperfusion therapy in 2006 <i>Denominator:</i> Total number of patients younger than 80 with STEMI or LBBB who were entered in the Swedish Heart Intensive Care Admissions (RIKS-HIA) database in 2006
Method of measurement	Patients admitted to the cardiac intensive care units (CICUs) of acute care hospitals are normally reported to RIKS-HIA. Some acute care hospitals participate in RIKS-HIA but do not have CICUs. They treat this patient group at another type of unit. Thus, the patient population reported to RIKS-HIA may differ somewhat from hospital to hospital. Patients are assigned to the region of the hospital to which they were first admitted rather than where they live. That hospital may either make a diagnosis and perform PCI or refer the patient to a hospital that is able to perform it. The ambulance paramedics may make the diagnosis themselves and drive directly to the hospital that has PCI expertise without going to the emergency room of the admitting hospital.
Data sources	Swedish Heart Intensive Care Admissions (RIKS-HIA)
Sources of error	All Swedish acute care hospitals, except two or three in Norrbotten, participate. Thus, no patients who received the therapy after diagnoses by those hospitals were included. RIKS-HIA's method of assigning patients to a region may lead to certain reporting differences compared with where they actually live. Due to regional and hospital variations in terms of the patients who are admitted to CICUs as opposed to another type of unit, the patient populations who are reported to RIKS-HIA may diverge somewhat among different regions.

A:34 Coronary angiography for patients with non-ST-segment elevation myocardial infarction

Measure	Percentage of patients who received coronary angiography for non-ST-segment elevation myocardial infarction (NSTEMI) in 2006
Description	The indicator includes all patients with NSTEMI, i.e., myocardial infarction other than STEMI or LBBB, upon arrival at intensive care. <i>Numerator:</i> Number of patients younger than 80 per region who were given coronary angiography for NSTEMI in 2006 <i>Denominator:</i> Total number of patients younger than 80 with NSTEMI who were entered in the RIKS-HIA database in 2006 The indicator covers patients who were discharged alive, whose ECG did not show ST-segment elevation upon arrival at intensive care and who had one of the following: pulmonary rales, mildly impaired left ventricular function or worse, diabetes, previous myocardial infarction or reduced ST-segment elevation on the ECG at arrival.
Method of measurement	See Indicator A:33
Data sources	Swedish Heart Intensive Care Admissions (RIKS-HIA)
Sources of error	See Indicator A:33

A:35 Clopidogrel therapy after non-ST-segment elevation myocardial infarction

Measure	Percentage of patients who received clopidogrel therapy for NSTEMI in 2006
Description	The indicator includes all patients with NSTEMI, i.e., myocardial infarction other than STEMI or LBBB, upon arrival at intensive care. Clopidogrel therapy refers to Plavix, Ticlid or another antiplatelet – alone or in combination with acetylsalicylic acid (ASA/aspirin) – at the time of discharge. <i>Numerator:</i> Number of patients younger than 80 per region with NSTEMI who received clopidogrel therapy in 2006 <i>Denominator:</i> Total number of patients younger than 80 with NSTEMI who were entered in the RIKS-HIA database in 2006 The indicator includes patients who were discharged alive, whose ECG did not show ST-segment elevation upon arrival at intensive care, who were not prescribed Waran or Exarta upon discharge, and who had not received or were scheduled for CABG.
Method of measurement	See Indicator A:33
Data sources	Swedish Heart Intensive Care Admissions (RIKS-HIA)
Sources of error	See Indicator A:33

A:36 Waiting times for cardiac surgery

Measure	Median waiting time for cardiac surgery in 2006
Description	The indicator refers to the number of days between the decision to operate and actual surgery. Average waiting times in 2006 are presented per region on the basis of the median. The indicator includes all patients were entered in the Swedish Heart Surgery Registry for 2006 – in other words, both patients who received acute surgery and those who waited a long time for a transplant or due to personal reasons.
Method of measurement	In addition to its normal statistical definition, median waiting time is also the most frequent. The indicator reflects how long patients from each region waited regardless of where surgery was performed. Patients were assigned to their particular region of domicile. While cardiac surgery is not available in all regions, patients from each region are referred to the centres that perform the procedure.
Data sources	Swedish Heart Surgery Registry
Sources of error	The register's participation rate for this variable is excellent, almost 100 percent. The number of observations in some regions may be low for particular years, leading to statistical uncertainty.

A:37 Lipid lowering drug therapy after myocardial infarction

Measure	Percentage of myocardial infarction patients who receive lipid lowering drugs				
Description	<i>Numerator:</i> Number of myocardial infarction patients age 79 and younger in 2005–2006 who picked up a prescription for a lipid lowering drug (statin) at least once between 1 January and 30 June 2007 <i>Denominator:</i> Total number of patients hospitalised for myocardial infarction in 2005–2006				
Method of measurement	Data on the number of patients with at least one care event for myocardial infarction were taken from the inpatient section of the Patient Register. The population includes people who had at least one care event in 2006 and who were alive on 30 June 2007. <table border="1"><thead><tr><th>Diagnosis</th><th>ICD-10 code</th></tr></thead><tbody><tr><td>Myocardial infarction</td><td>I21, I22</td></tr></tbody></table> Data were taken from the Prescribed Drug Register concerning prescriptions for lipid lowering drugs (ATC-C10AA) that these people picked up between 1 January and 30 June 2007. The percentages were not age-standardised. Each care event was assigned to the patient's region of domicile at the time.	Diagnosis	ICD-10 code	Myocardial infarction	I21, I22
Diagnosis	ICD-10 code				
Myocardial infarction	I21, I22				

Data sources	Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW) Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	There was very little dropout of personal identity numbers in the inpatient section of the Patient Register. Variations in diagnostic criteria among the different regions may have influenced the size of the myocardial infarction population. Because the Prescribed Drug Register does not include drugs dispensed from a drug storehouse in an assisted living facility or bought on a non-prescription basis, consumption among the elderly may be understated. Given that the register contains data only for drugs picked up from a pharmacy, the reported quantity prescribed may be low.

ORTHOPAEDIC CARE

A:38 Total knee arthroplasty – revisions within one year due to infection

Measure	Number of total knee arthroplasty revisions per 1 000 initial operations within one year due to infection
Description	A revision is a reoperation in which prosthesis components are added, removed or replaced. The indicator does not include infections treated without revision. The indicator covers all patients in 1996–2005 who received total knee arthroplasty for osteoarthritis. The indicator presents the number of revisions due to infection within a year after the primary operation. The number is specified per 1 000 primary operations entered in the Swedish Knee Arthroplasty Register for 1996–2005.
Method of measurement	Each reoperation was assigned to the clinic's region rather than where the patient was living. The register contains data for hospitals and clinics from every region. The register's participation rate is good.
Data sources	Swedish Knee Arthroplasty Register
Sources of error	The calculations were not adjusted for variations in region-specific revision or infection risk, or in the number of patients. General interpretation difficulties related to this simplification were previously discussed in connection with geographic comparisons and were presented in the 2004 annual report of the Swedish Knee Arthroplasty Register.

A:39 Knee arthroplasty – five-year risk of revision

Measure	Risk of revision within five years regardless of the reason
Description	A revision is a reoperation in which prosthesis components are added, removed or replaced. The indicator covers all patients in 1996–2005 who received total knee arthroplasty for osteoarthritis. The indicator specifies the risk that a revision will be performed within five years after the primary operation regardless of the reason.

Method of measurement	See Indicator A:38
Data sources	Swedish Knee Arthroplasty Register
Sources of error	The calculations were not adjusted for variations in region-specific revision risk, or in the number of patients. General interpretation difficulties related to this simplification were previously discussed in connection with geographic comparisons and were presented in the 2004 annual report of the Swedish Knee Arthroplasty Register.

A:40 Total hip replacement arthroplasty – 10-year implant survival

Measure	Percentage of implants that survive for ten years after total hip replacement arthroplasty
Description	Survival refers to the number of years after primary surgery before the prosthesis must be replaced. Non-survival or failure refers to surgery to replace a component or the entire prosthesis. The indicator includes all surgery performed in 1992–2006 and entered in the Swedish National Hip Arthroplasty Register. All patients are covered, regardless of age or the underlying reason for surgery.
Method of measurement	The Kaplan-Meier method was used to estimate the survival function. All relevant Swedish clinics report data for primary total hip replacement arthroplasty to the Swedish National Hip Arthroplasty Register. Each operation was assigned to the region in which the clinic was located rather than where the patient was living.
Data sources	Swedish National Hip Arthroplasty Register
Sources of error	The participation rate for this variable is excellent. Differing regional age structures and underlying reasons for the operation may influence the results. The results may also be influenced by inter-hospital task allocation with respect to the location of complicated, high-risk operations.

A:41 Total hip replacement arthroplasty – reoperation within 2 years

Measure	Percentage of operations, regardless of the reason, within two years after total hip replacement arthroplasty
Description	<i>Numerator:</i> Number of operations, regardless of the reason, within two years after total hip replacement arthroplasty <i>Denominator:</i> Total number of hip replacement arthroplasty procedures entered in the Swedish National Hip Arthroplasty Register in 2003–2006
Method of measurement	Only complications treated surgically (reoperated) are included. Infections treated with antibiotics or non-surgical total dislocations (luxations) are not included. Multiple reoperations for the same reason are regarded as one. Reoperations at a non-primary clinic or region are assigned to the primary clinic or region. Each operation was assigned to the region in which the primary clinic was located rather than where the patient was living.

Data sources	Swedish National Hip Athroplasty Register
Sources of error	See Indicator A:40

A:42 Total hip replacement arthroplasty – patient-reported outcome

Measure	Patient-reported outcome of total hip replacement arthroplasty
Description	The indicator reflects patient-reported health in accordance with the EQ-5D instrument one year after total hip replacement arthroplasty compared with pre-surgery. The data are for 2003–2006.
Method of measurement	The Swedish National Hip Athroplasty Register follows up on the patient-reported outcome of surgery. The register presents results for 14 regions this year. Patient-reported health is based on the EQ-5D instrument (five questions), which generates a weighted total index score for health-related quality of life. The poorest score is -0.594, while the highest score is 1.0. The same questionnaire that is used prior to surgery is sent to the patient one year later with an additional question about level of satisfaction. The difference between the two results is reported as improvement in accordance with EQ-5D. Each operation was assigned to the region in which the clinic was located rather than where the patient was living.
Data sources	Swedish National Hip Athroplasty Register
Sources of error	Variations in patient mix (severity of disease, concurrent diseases, etc.) may influence the results. The register contains individual-based demographic variables (case mix). The variables are presented per clinic in the register's annual report. The variables should always be stated and considered when performing an in-depth analysis in order to compare various EQ-5D results.

A:43 Hip fracture – patients discharged to home

Measure	Percentage of hip fracture patients discharged to home after hospitalisation
Description	The indicator shows the percentage of patients who are discharged to their previous address after hospitalisation. Thus, the indicator is a measure of the extent to which function is restored after hip fracture. <i>Numerator:</i> Number of hip fracture patients discharged to home in 2006 <i>Denominator:</i> Total number of hip fracture patients in 2006
Method of measurement	Patients were assigned to the clinic's region rather than where they were living. Data on hip fracture patients are reported to the National Hip Fracture Register (RIKSHÖFT). Three regions did not report. Data quality from reporting hospitals was high.
Data sources	National Hip Fracture Register (RIKSHÖFT)
Sources of error	The participation rate is neither known at the regional level nor calculated at the national level. A patient discharged from an orthopaedic clinic to a rehabilitation clinic, even for a short time, was not reported as having been discharged to home.

A:44 Hip fracture – waiting time for surgery

Measure	Waiting time for hip fracture surgery after admission to hospital
Description	The indicator shows the number of days it took from arrival at hospital until surgery. The indicator presents the average waiting time per region for all hip fracture patients in 2006.
Method of measurement	Data on average waiting time for surgery are based on the dates of arrival and surgery. As of 2006, the times of day and number of hours are reported instead. See Indicator A:43
Data sources	National Hip Fracture Register (RIKSHÖFT)
Sources of error	The participation rate is neither known at the regional level nor calculated at the national level.

OTHER TREATMENTS

A:45 inguinal hernia – relative risk of reoperation within 5 years

Measure	Relative risk of reoperation for inguinal hernia within 5 years
Description	Relative risk measures the risk of reoperation within 5 years after surgery for inguinal hernia at hospitals in a region compared with the risk at hospitals in the other regions. The indicator includes all inguinal hernia surgery reported in 1992–2006.
Method of measurement	All inguinal hernia surgery reported to the Swedish Hernia Register is followed up on until such time as a reoperation is performed in the same groin. Based on these data, the risk of reoperation in the same groin can be calculated in relation to the amount of time that has passed since primary surgery. Each reoperation was assigned to the clinic's region rather than where the patient was living.
Data sources	Swedish Hernia Register
Sources of error	The register's participation rate is an excellent 95 percent. Some clinics operate on more inguinal hernia patients who require greater technical resources.

A:46 Cataract surgery, visual acuity below 0.5 in the better seeing eye

Measure	Percentage of cataract patients who have visual acuity below 0.5 in the better seeing eye at the time of surgery
Description	<i>Numerator:</i> Number of cataract patients who had visual acuity below 0.5 dioptries in the better seeing eye at the time of surgery in 2006 <i>Denominator:</i> Total number of patients who received cataract surgery that was entered in the Swedish National Cataract Register for 2006
Method of measurement	Nearly 80 000 cataract operations, representing nearly all those performed in Sweden, are entered in the Swedish National Cataract Register every year. Patients were assigned to their region of domicile.

Data sources	Swedish National Cataract Register
Sources of error	The basic data are deemed to be of good quality.

A:47 Suicide and attempted suicide after psychiatric care

Measure	Number of suicides and attempted suicides within 90 days after discharge from inpatient psychiatric care per 100 000 inhabitants.
Description	The indicator includes verified suicides and attempted suicides by people who had been inpatients with a primary diagnosis that was psychiatric. The indicator is presented by region per 100 000 inhabitants in 2002–2006.
Method of measurement	Data were age-standardised based on the national population in 2000 as the standard.

Diagnosis	ICD-10 code
Suicide/attempted suicide	X60-X84
Psychiatric diagnosis	F04-F99

Patients were assigned to their region of domicile.

Data sources	Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW) Cause of Death Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)
Sources of error	The indicator is difficult to interpret. High values can be a sign that well-functioning psychiatric care is successfully identifying patients with suicidal tendencies but that continuing care after discharge from an inpatient facility suffers from certain shortcomings. The criteria for admission after attempted suicide influences the number of people who are reported. The criteria for inpatient care of psychiatric patients, regardless of whether they have attempted suicide or not, influences whether any subsequent attempted suicide has occurred within 90 days of discharge. Regional differences in diagnostic criteria can influence the results.

A:48 Eating disorders – treatment results after one year

Measure	Percentage of patients with an eating disorder whose condition has improved one year after commencement of treatment
Description	Improvement means that the patient was diagnosed either as still having an eating disorder but showing signs of progress at 1-year follow-up or as no longer having an eating disorder. Eating disorder refers to anorexia nervosa, bulimia nervosa or Eating Disorder Not Otherwise Specified (EDNOS). <i>Numerator:</i> Number of eating disorder patients whose condition had improved one year after commencement of treatment <i>Denominator:</i> Total number of patients entered in the National Quality Register on Eating Disorders (RIKSÄT) who started treatment in 2003–2005 and were followed up after one year
Method of measurement	Of 32 specialised eating disorder units in Sweden, 30 report to RIKSÄT to one extent or another. Twenty specialised eating disorder teams at other psychiatric units also report. Patients were assigned to their region of domicile.
Data sources	National Quality Register on Eating Disorders (RIKSÄT)
Sources of error	The data do not permit ranked comparisons among the various regions. Although several years were combined, few patients were reported and even fewer were followed up on. Two regions have no units that report to RIKSÄT and were thereby not included, while one region refrained from reporting due to an inadequate participation rate. In addition to the low percentage of reported cases, there are two other conceivable sources of error. In the first place, diagnostic methods may vary from region to region. In the second place, the comparison does not consider regional differences in the patient population due to factors such as the age groups treated and referral procedures.

B Patient Experience

B:1 General population – availability of health care

Measure	Percentage of the general population who report having access to the care that they need
Description	The indicator shows perceptions among members of the general population about their access to health care regardless of whether they have had recent contact with the system or not. <i>Numerator:</i> Number of selected members of the general population in 2006 that agreed wholly or in part with the statement that they had access to the health care that they needed <i>Denominator:</i> Total number of interviewees in the 2006 sample of the general population
Method of measurement	The data are based on telephone interviews with almost 42 000 selected members of the general population age 18 and older. The study consisted of four annual rounds, each of which involved 250 interviews in each region. In order to improve statistical reliability, the sample was larger in some regions.
Data sources	Population and patient survey, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The response rate was approximately 70 percent in each region.

B:2 General population – confidence in primary care

Measure	Percentage of the general population who reported having a lot or quite a lot of confidence in the care provided by health centres or the equivalent
Description	The indicator reflects confidence among members of the general population in primary care regardless of whether or not they had recent contact with a health centre. <i>Numerator:</i> Number of selected members of the general population in 2006 reporting that they had a lot or quite a lot of confidence in the care provided by health centres <i>Denominator:</i> Total number of interviewees in the 2006 sample of the general population
Method of measurement	See Indicator B:1
Data sources	Population and patient survey, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The response rate was approximately 70 percent in each region.

B:3 General population – confidence in hospital care

Measure	Percentage of the general population who reported having a lot or quite a lot of confidence in the care provided by hospitals
Description	The indicator reflects confidence among members of the general population in care and treatment regardless of whether or not they had recent contact with a hospital. <i>Numerator:</i> Number of selected members of the general population in 2006 reporting that they had a lot or quite a lot of confidence in hospital care <i>Denominator:</i> Total number of interviewees in the 2006 sample of the general population
Method of measurement	See Indicator B:1
Data sources	Population and patient survey, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The response rate was approximately 70 percent in each region.

B:4 Patient ratings of their most recent visit at a health centre

Measure	Percentage of patients who have a favourable perception of their latest visit at a health centre or the equivalent
Description	Patients refer to people who had had a visit, themselves or accompanying next of kin or a closely related person, at a health centre (or the equivalent) during the past 12 months. Having a favourable perception means a rating of 4 or 5 on a 5-point scale. <i>Numerator:</i> Number of people in 2006 who had a favourable perception of their latest visit at a health centre <i>Denominator:</i> Total number of interviewees in 2006 who had had a visit at a health centre
Method of measurement	The data are based on telephone interviewees who stated that they had had a visit at a health centre. The survey included almost 42 000 selected interviewees age 18 and older.
Data sources	Population and patient survey, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The response rate for the total interview study was approximately 70 percent in each region.

B:5 Patient ratings of their most recent visit at a hospital

Measure	Percentage of patients who have a favourable perception of their latest visit at a hospital
Description	Patients refer to people who had had a visit, themselves or accompanying next of kin or a closely related person, at a department or outpatient clinic of a hospital during the past 12 months. Having a favourable perception means a rating of 4 or 5 on a 5-point scale. <i>Numerator:</i> Number of people in 2006 who had a favourable perception of their latest visit at a hospital <i>Denominator:</i> Total number of interviewees in 2006 who had had a visit at a department or outpatient clinic of a hospital
Method of measurement	The data are based on telephone interviewees who stated that they had had a visit at a hospital. The survey included almost 42 000 selected interviewees age 18 and older.
Data sources	Population and patient survey, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The response rate for the total interview study was approximately 70 percent in each region.

B:6 Patient perception of whether they received the help they expected at their visit

Measure	Percentage of patients who feel that they have received the help they expected at their visit
Description	Patients refer to people who had had a visit, themselves or accompanying next of kin or a closely related person, at some type of outpatient clinic during the past 12 months. <i>Numerator:</i> Number of people in 2006 who agreed wholly or in part with the statement that they had received the help they expected during a visit at some type of outpatient clinic <i>Denominator:</i> Total number of interviewees in 2006 who had had a visit at some type of outpatient clinic
Method of measurement	The data are based on telephone interviewees who stated that they had had a visit at some type of outpatient clinic. The survey included almost 42 000 selected interviewees age 18 and older.
Data sources	Population and patient survey, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The response rate for the total interview study was approximately 70 percent in each region.

B:7 Patients who reported having had a reasonable waiting time for an appointment at a health centre

Measure	Percentage of patients who feel that their waiting time for an appointment at a health centre was reasonable
Description	Patients refer to people who had had an appointment, themselves or accompanying next of kin or a closely related person, at a health centre (or the equivalent) during the past 12 months. <i>Numerator:</i> Number of patients in 2006 who felt that their waiting time for an appointment at a health centre or the equivalent was reasonable <i>Denominator:</i> Total number of interviewees in 2006 who had had an appointment at a health centre or the equivalent
Method of measurement	The data are based on telephone interviewees who stated that they had had an appointment at a health centre or the equivalent. The survey included almost 42 000 selected interviewees age 18 and older.
Data sources	Population and patient survey, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The response rate for the total interview study was approximately 70 percent in each region.

B:8 Patient perception of the availability of health centres by phone

Measure	Percentage of patients who feel that it is easy to reach health centres or the equivalent by phone
Description	<i>Numerator:</i> Number of interviewees in 2006 who felt that it was easy or very easy to reach health centres or the equivalent by phone <i>Denominator:</i> Total number of interviewees in 2006 who had had a visit at a health centre or the equivalent and who had phoned ahead of time
Method of measurement	The survey included almost 42 000 selected interviewees age 18 and older. The indicator includes only interviewees who had had a visit at or phoned a health centre.
Data sources	Population and patient survey, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The response rate for the total interview study was approximately 70 percent in each region.

B:9 Stroke patient satisfaction with hospital care

Measure	Percentage of stroke patients reporting that they are satisfied or highly satisfied with the hospital care they have received
Description	<i>Numerator:</i> Number of patients in 2006 who responded in a questionnaire three months after stroke that they were satisfied or highly satisfied with the hospital care they had received <i>Denominator:</i> Total number of stroke patients who responded to the questionnaire in 2006
Method of measurement	Follow-up by the National Quality Register for Stroke includes a questionnaire that allows patients to express their views three months after stroke concerning various aspects of the care they have received. All acute care hospitals that treat stroke patients participate. The data collected from the various hospitals are analysed each year. Data were assigned to the region in which the clinic was located rather than where the patient was living.
Data sources	National Quality Register for Stroke
Sources of error	The percentage of stroke cases reported to the register varied from region to region. The response rate to the patient questionnaire also exhibited regional differences but totalled 90 percent nationwide.

B:10 Stroke patient satisfaction with rehabilitation

Measure	Percentage of stroke patients reporting that they are satisfied or highly satisfied with the rehabilitation they have received
Description	<i>Numerator:</i> Number of patients in 2006 who responded in a questionnaire three months after stroke that they were satisfied or highly satisfied with the rehabilitation they had received <i>Denominator:</i> Total number of stroke patients who responded to the questionnaire in 2006
Method of measurement	See Indicator B:9
Data sources	National Quality Register for Stroke
Sources of error	See Indicator B:9

C Time-related Availability

PRIMARY CARE

C:1 Percentage of patients who were given a doctor's appointment within a week – primary care

Measure	Percentage of patients who were given a doctor's appointment within seven days in primary care in March 2007
Description	The indicator reflects the number of patients who were given an appointment at a primary care clinic within seven days in relation to the total number of reported appointments covered by Sweden's healthcare guarantee. The waiting time runs from the date on which patient contacted the health centre and was given an appointment until the date of the appointment. A doctor's appointment is defined as an occasion on which a patient sees a doctor for either a previously unknown health problem or unexpected or substantial deterioration of a previously known health problem. Occasions on which a patient sees a doctor to check up on or monitor a known health problem or to obtain a medical certificate are not included. Patients who choose an appointment after the earliest one offered to them are not included either. <i>Numerator:</i> Number of patients who were given appointments at a primary care clinic within seven days on 26–30 March 2007 <i>Denominator:</i> Total number of reported appointments at primary care clinics on 26–30 March 2007
Method of measurement	All health centres or the equivalent report data on waiting times in calendar days per patient for relevant patient groups. Private primary care clinics with health-care agreements are also included. Only appointments at primary care clinics during ordinary office hours are reported. The measurement has been performed for five consecutive days each March and October starting in 2006. The data are reported online using a specially designed tool.
Data sources	Waiting Times in Health Care database, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	Some health centres have identified problems in defining the patient group when measurement instructions are not followed but data are entered afterwards using an appointment book. The extent to which the health centres report occasions on which the patient chooses a later appointment than the earliest one offered is also unclear because that information is usually not recorded when the appointment is made. The percentage of patients who are given appointments within seven days is dependent on how long in advance they can receive an appointment. Some health centres make appointments only a limited number of days in advance. Availability data are misleading for health centres where patients can make an appointment for the same day only and must phone again the next day if all time slots are already filled.

C:2 Percentage of patients who were given a doctor's appointment the same day – primary care

Measure	Percentage of patients who were given a doctor's appointment the same day in primary care in March 2007
Description	A doctor's appointment is defined as an occasion on which a patient sees a doctor for either a previously unknown health problem or unexpected or substantial deterioration of a previously known health problem. Occasions on which a patient sees a doctor to check up on or monitor a known health problem or to obtain a medical certificate are not included. The waiting time runs from the date on which the patient contacted the health centre and was given an appointment until the date of the appointment. <i>Numerator:</i> Number of patients who were given appointments at a primary care clinic the same day on 26–30 March 2007 <i>Denominator:</i> Total number of reported appointments at primary care clinics on 26–30 March 2007
Method of measurement	See Indicator C:1
Data sources	Waiting Times in Health Care database, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	See Indicator C:1

SPECIALISED CARE

C:3 Number of patients with waiting times longer than 90 days – specialised outpatient clinics

Measure	Number of patients per 1 000 inhabitants who wait longer than 90 days for an initial appointment in scheduled specialised care
Description	The indicator reflects the number of patients per 1 000 inhabitants who had waited longer than 90 days for an initial appointment in specialised care on 30 April 2007. The indicator covers patients in scheduled, specialised care for whom a decision concerning a referral or a commitment to an appointment had been made in accordance with specific indications and with the concurrence of the patient. The indicator includes patients whose appointment was moved up and those for whom children and adults were on the same waiting list. The indicator excludes patients who waited at least 14 days longer than offered, either by their own choice or for medical reasons.

Method of measurement	County councils report data to the Waiting Times in Health Care database concerning publicly financed scheduled specialised care services, i.e., services provided under the auspices of the county councils and private caregivers with agreements whose offering meets the selection criteria of the database. The database for specialised care does not contain patient-specific data, but consists of aggregate data that are collected chiefly from patient and care administrative systems. The database's offering covers almost all (85-90 percent) scheduled services, while the healthcare guarantee applies to all scheduled care. Because of regional variations in the response rate, data are presented here only for regions with a response rate of 90 percent or higher.
Data sources	Waiting Times in Health Care database, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	Local quality assurance efforts differ from region to region when it comes to both organisation and reporting procedures for monitoring availability. Given that low response rates by some regions and/or types of services represent a significant source of error, the comparison does not include all regions.

C:4 Number of patients with waiting times longer than 90 days – intervention and treatment

Measure	Number of patients per 1 000 inhabitants who wait longer than 90 days for intervention or treatment in scheduled specialised care
Description	The indicator reflects the number of patients per 1 000 inhabitants who had waited longer than 90 days for intervention or treatment in specialised care on 30 April 2007. See Indicator C:3
Method of measurement	The data for the number of patients who waited cover only the 44 types of interventions and treatment methods included in the reporting, whereas the healthcare guarantee covers all scheduled care. Because of regional variations in the response rate, data are presented here only for regions with a response rate of 90 percent or higher. See Indicator C:3
Data sources	Waiting Times in Health Care database, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The criteria and medical indications that determine whether a patient will be placed on a waiting list or schedule may vary. See Indicator C:3

D Costs

COST PER CAPITA

D:1 Healthcare cost per capita

Measure	County council costs for health care per capita in Swedish kronor in 2006
Description	Cost refers to net costs, i.e., costs less income. Net costs are those that are financed by county council taxes, general government subsidies and net financial income. Costs for private care and care provided by another county council are included. Costs for services that one county council sells to another one are not included. The costs are presented in Swedish kronor per capita for each region. Costs do not include dental care. Home healthcare services are excluded from health care given that the responsibility of county councils vis-à-vis local governments varies following the 1992 Elderly Reform Act.
Method of measurement	County councils report cost and income data on an annual basis for various areas and sub-areas in accordance with VI 2000, a joint classification system. Health care represents one of two main areas, dental care represents one area and home healthcare services represent one sub-area. Reconciliation is performed to external accounts. The number of inhabitants reflects the population on 31 December 2006.
Data sources	Financial and service statistics according to VI 2000, Swedish Association of Local Authorities and Regions (SALAR) Population statistics, Statistics Sweden
Sources of error	Costs for health care excluding dental care are a well established measure of good quality. But county councils have certain problems separating out home healthcare services given that they are incorporated into other health care. Including home healthcare services would further compromise comparability. Attempts at interpretation should note that the indicator does not consider differing needs of the populations in various regions.

D:2 Actual versus expected healthcare costs

Measure	County council costs for health care per capita in Swedish kronor in 2006 compared to expected costs
Description	The indicator reflects costs after consideration has been taken to structural variations among different regions. The indicator is calculated as the ratio between actual net cost and expected net cost adjusted for structural factors, i.e., standard cost per capita. The ratio is expressed as the deviation from the nationwide average per capita (index). <i>Numerator:</i> Actual net healthcare costs in 2006 (see description of Indicator D:1), including home healthcare services and excluding dental care and the pharmaceutical benefits scheme, divided by the average cost for all regions and multiplied by 100 (indexed) <i>Denominator:</i> Expected net cost per capita in accordance with the need index calculated for 2006 by the system of economic equalisation for local governments, which adjusts for differing regional conditions

Method of measurement	The index number for actual net cost is calculated by dividing net cost by the average cost for all regions and multiplying the quotient by 100. For instance, Norrbotten had an index number of 109, given that its net cost was 9 percent above the nationwide average in 2006. Expected net cost in accordance with the need index is calculated each year by the system of economic equalisation for local governments. The index is to be adjusted to the varying demographic structures of different regions. Among the variables that influence the index are sparsely populated areas, population groups that require a disproportionate percentage of health care, age, employment, income and housing. For instance, the need index for the Norrbotten County Council in 2006 was 106, i.e., its expected net cost per capita was 6 percent above the nationwide average. The index for actual cost is divided by the index for expected cost and the quotient is multiplied by 100. For instance, the 2006 index number for Norrbotten is $103 = (109/106) \cdot 100$, i.e., its cost is 3 percent above the nationwide average after adjusting for differing regional conditions.
Data sources	Financial and service statistics according to VI 2000, Swedish Association of Local Authorities and Regions (SALAR) Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW), Population statistics, Statistics Sweden
Sources of error	The inclusion of home health care services compromises comparability given that the responsibility of the county councils to local governments varies. The "need index" measure is well established and widely used. But there is disagreement as to whether the model fairly captures differing regional conditions.

D:3 Net cost per capita – primary care

Measure	County council costs for primary care per capita in Swedish kronor in 2006
Description	Primary care includes general practitioners, nurses, maternal and paediatric care, physical therapy, occupational therapy, emergency services, etc. Costs for the pharmaceutical benefits scheme are excluded given that county councils do not consistently report costs for the service that receives patients. Home healthcare services are also excluded because the responsibility of county councils vis-à-vis local governments varies following the 1992 Elderly Reform Act. Cost is defined as net cost, i.e., costs less income for 2006 (see detailed explanation under Indicator D:1). Cost is presented in Swedish kronor per capita.
Method of measurement	County councils report cost and income data on an annual basis for various areas and sub-areas in accordance with VI 2000, a joint classification system. The number of inhabitants reflects the population on 31 December 2006.
Data sources	Financial and service statistics according to VI 2000, Swedish Association of Local Authorities and Regions (SALAR) Population statistics, Statistics Sweden
Sources of error	Data quality and comparability appear to be good even though county councils may have certain problems separating out home healthcare services given that they are incorporated into other health care. Attempts at interpretation should note that the indicator does not consider differing needs of the populations in various regions.

D:4 Net cost per capita – specialised medical care

Measure	County council costs for specialised medical care per capita in Swedish kronor in 2006
Description	Specialised medical care includes short-term medical and surgical care, as well as rehabilitation and geriatrics. Both inpatient and outpatient services are included. Costs for home healthcare services and the pharmaceutical benefits scheme are excluded (see description of Indicator D:3 for the reason). Cost is defined as net cost, i.e., costs less income for 2006 (see detailed explanation under Indicator D:1). Cost is presented in Swedish kronor per capita.
Method of measurement	County councils report cost and income data on an annual basis for various areas and sub-areas in accordance with VI 2000, a joint classification system. The definitions and instructions of VI 2000 indicate what is to be reported as specialised medical care. The number of inhabitants reflects the population on 31 December 2006.
Data sources	Financial and service statistics according to VI 2000, Swedish Association of Local Authorities and Regions (SALAR) Population statistics, Statistics Sweden
Sources of error	Data quality and comparability appear to be good even though county councils may have certain problems separating out home healthcare services given that they are incorporated into other health care. Attempts at interpretation should note that the indicator does not consider differing needs of the populations in various regions.

D:5 Net cost per capita – specialised psychiatric care

Measure	County council costs for specialised psychiatric care per capita in Swedish kronor in 2006
Description	Specialised psychiatric care includes general, child and adolescent, and forensic psychiatry. Both short-term and long-term care are included. Costs for home healthcare services and the pharmaceutical benefits scheme are excluded (see description of Indicator D:3 for the reason). Cost is defined as net cost, i.e., costs less income for 2006 (see detailed explanation under Indicator D:1). Cost is presented in Swedish kronor per capita.
Method of measurement	County councils report cost and income data on an annual basis for various areas and sub-areas in accordance with VI 2000, a joint classification system. The definitions and instructions of VI 2000 indicate what is to be reported as specialised psychiatric care. The number of inhabitants reflects the population on 31 December 2006.
Data sources	Financial and service statistics according to VI 2000, Swedish Association of Local Authorities and Regions (SALAR) Population statistics, Statistics Sweden
Sources of error	Data quality and comparability appear to be good even though county councils may have certain problems separating out home healthcare services given that they are incorporated into other health care. Attempts at interpretation should note that the indicator does not consider differing needs of the populations in various regions.

D:6 Healthcare cost trends

Measure	Percentage change in county council costs per capita from 2004 to 2006
Description	Cost is defined as net healthcare cost, i.e., costs less income for 2004 and 2006 (see detailed explanation under Indicator D:1). Costs do not include dental care. Costs for restructuring and home healthcare services are excluded. The cost is calculated per capita. The cost trend is calculated as the total percentage change per capita from 2004 to 2006. <i>Numerator:</i> Cost per capita in 2004 <i>Denominator:</i> Cost per capita in 2006
Method of measurement	See description of cost reporting under Indicator D:1. The number of inhabitants reflects the population on 31 December 2006.
Data sources	Financial and service statistics according to VI 2000, Swedish Association of Local Authorities and Regions (SALAR) Population statistics, Statistics Sweden
Sources of error	The rate of increase refers to net costs in current prices, i.e., unadjusted for wage and price growth.

COST PER CARE EVENT OR VISIT

D:7 Cost per DRG-weighted case – specialised medical care

Measure	County council costs in Swedish kronor per consumed care event or visit (DRG) in specialised medical care for 2006
Description	Specialised medical care includes short-term medical and surgical care, as well as rehabilitation and geriatrics. The indicator includes inpatient, outpatient and home healthcare services. Cost is defined as net cost (see detailed description under Indicator D:1). Costs for the pharmaceutical benefits scheme are excluded. Care events or visits are expressed as consumed DRG. The total DRG-points are the sum of each contact with the healthcare system times the weight assigned to the particular contact.

Method of measurement	Net cost is adjusted for the purchase and sale of specialised medical services among county councils in order to match up the data that are used. The DRG-points are calculated on the basis of care events and visits consumed by county councils adjusted for the weight that has been assigned to each contact. All care events, along with doctor's appointments in DRG groups 003O–720O, are aggregated in NordDRG and thereby assigned a DRG group and weight in accordance with the latest available classification and weight list. The remaining visits are broken down into caregiver category and service area and assigned a standard weight for each group. The weights for NordDRG are calculated from the national Cost Per Patient (CPP) database, which contains actual costs per care event for almost 50 percent of inpatient services in 2006. The care events and visits are taken from national patient registers and SALAR's visit statistics. Contacts and costs that cannot be linked to a particular region are assigned to the nationwide results.
Data sources	Financial and service statistics according to VI 2000, Swedish Association of Local Authorities and Regions (SALAR) Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW) CPP database, Swedish Association of Local Authorities and Regions (SALAR) Statistical processing, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	The total DRG-points are calculated on the basis of the primary entries, generally with respect to diagnosis and intervention, of individual contacts with the healthcare system. Thus, errors in basic coding may influence results, though only marginally. DRG adjusts for regional differences in patient mix, patient age and disease severity, but not for other factors. The Patient Register is well established in inpatient care, but inadequacies remain when it comes to outpatient care.

D:8 Cost per DRG, change from 2004 to 2006

Measure	Cost per DRG, change from 2004 to 2006 in specialised medical care
Description	Cost is defined as net cost (see detailed description under Indicator D:1). Costs for the pharmaceutical benefits scheme are excluded. Care events or visits are expressed as consumed DRG. The total DRG-points are the sum of each contact with the healthcare system times the weight assigned to the particular contact (see detailed description under Indicator D:7). The annual change is defined as the average of the changes from 2004 to 2005 and 2005 to 2006.
Method of measurement	Net cost is adjusted for the purchase and sale of specialised medical services among county councils in order to match up the data that are used. The costs are inflation-adjusted to the County Council Price Index (LPI). The latest available version of NordDRG and actual DRG weights are used for each year.

Data sources	See Indicator D:7
Sources of error	See Indicator D:7

D:9 Cost per outpatient contact – primary care

Measure	County council cost per weighted outpatient contact in primary care in 2006
Description	See the description under Indicator D:3 for a definition of primary care. Cost is defined as net cost (see detailed description under Indicator D:1). Costs for the pharmaceutical benefits scheme are excluded given that county councils do not consistently report costs for the service that receives patients. Home healthcare services are also excluded because the responsibility of county councils vis-à-vis local governments varies following the 1992 Elderly Reform Act. Weighted outpatient contact includes the number of visits (clinic, home, etc.) and phone calls (only one if they take the place of a visit) with a doctor or other caregiver. The contacts are aggregated based on average resource consumption.
Method of measurement	Outpatient contacts are weighted according to place (phone or clinic), the type of caregiver involved, and the category for which they are reported (such as occupational therapy or general practitioner's care). The various types of visits and phone calls are weighted according to average resource consumption. Contacts with doctors and other caregivers are weighted similarly. A home visit corresponds to 2 visits at a clinic, and a phone call corresponds to 1/3 of a visit at a clinic. A visit with a non-doctor corresponds to 40 percent of a visit with a doctor. The outpatient contacts are then weighted according to the average cost per contact for each category (general practitioner's care, nursing care, etc).
Data sources	Financial and service statistics according to VI 2000, Swedish Association of Local Authorities and Regions (SALAR)
Sources of error	There is some uncertainty with regard to breaking down outpatient contacts by type of visit, as well as to phone call data. The statistics are relatively new, and reporting is not yet complete in all regions. In terms of cost calculations, county councils have certain problems separating out home healthcare services since they are incorporated into other health care.

COST-EFFECTIVE TREATMENT OPTIONS – CHOOSING AMONG EQUIVALENT DRUGS OR BETWEEN DAY-CASE AND INPATIENT SURGERY

D:10 Percentage of gastric ulcers treated with omeprazole

Measure Percentage of patients who were prescribed omeprazole for gastric ulcers in 2006

Description The indicator presents the number of patients who were prescribed omeprazole as a percentage of all those who were prescribed a proton pump inhibitor.
Numerator: Number of gastric ulcer patients who were given omeprazole as their first prescription in 2006
Denominator: Total number of patients who were prescribed some type of proton pump inhibitor as their first prescription in 2006

Method of measurement For each drug, the data were taken from the Prescribed Drug Register and concerned the first time that a patient picked up a prescription.

Drug	ATC code
Omeprazole	A02BC01
Proton pump inhibitors	A02BC

Each prescription was assigned to the patient's region of domicile.
The figure also shows the cost reduction. The cost savings are calculated on the basis of a counterfactual prescription of omeprazole only. The cost for omeprazole is adjusted upward to what it would be if all prescriptions were for the drug. The higher cost is subtracted from the current total cost for all proton pump inhibitors – the difference represents the cost savings.

Data sources Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)

Sources of error Using the first prescription that the patient picked up during the year offers an approximate comparison of the various drugs but not an exact one.

D:11 Percentage of low-cost statins prescribed for lipid lowering therapy

Measure Percentage of patients who were prescribed low-cost statins for lipid lowering therapy in 2006

Description The indicator presents the number of patients who were prescribed simvastatin or pravastatin as a percentage of all those who were prescribed statins.
Numerator: Number of patients whose first prescription in 2006 was simvastatin or pravastatin for lipid lowering therapy
Denominator: Total number of patients who were prescribed some type of statin for lipid lowering therapy in 2006

Method of measurement For each drug, the data were taken from the Prescribed Drug Register and concerned the first time that a patient picked up a prescription.

Drug	ATC code
Simvastatin	C10AA01
Pravastatin	C10AA03
Statins	C10AA

Each prescription was assigned to the patient's region of domicile.

See Indicator C:12 for calculation of cost savings.

Data sources Prescribed Drug Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)

Sources of error Using the first prescription that the patient picked up during the year offers an approximate comparison of the various drugs but not an exact one.

D:12 Prolapse of the uterus – percentage of day-case surgery

Measure Percentage of day-case surgery for prolapse of the uterus in 2006

Description The indicator reflects the number of day-case operations as a percentage of all surgery for prolapse of the uterus.

Numerator: Number of day-case operations for prolapse of the uterus in 2006

Denominator: Total number of operations for prolapse of the uterus in 2006, including inpatient care

Method of measurement The definition of prolapse of the uterus uses the same diagnostic codes as the Waiting Times in Health Care database of SALAR.

The indicator is based on the number of operations, which is not necessarily the same as the number of patients operated on.

Diagnosis	ICD-10 code	Intervention code
Prolapse of the uterus	N81.1-N81.6, N81.9, N88.4, N99.3	LEF

Each operation was assigned to the patient's region of domicile.

Data sources Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW)

Sources of error Reporting to the Patient Register is incomplete, particularly when it comes to dropout in outpatient care. That may partially influence the results. Dropout in some regions is due to the failure of private caregivers to report to the register. Because some county councils have system errors, their intervention codes were not reported at the time of the care event.

D:13 Inguinal hernia – percentage of day-case surgery

Measure	Percentage of day-case surgery for inguinal hernia in 2006						
Description	The indicator reflects the number of day-case operations as a percentage of all surgery for inguinal hernia. <i>Numerator:</i> Number of day-case operations for inguinal hernia in 2006 <i>Denominator:</i> Total number of operations for inguinal hernia in 2006, including inpatient care						
Method of measurement	The definition of inguinal hernia uses the same diagnostic codes as the Waiting Times in Health Care database of SALAR. The indicator is based on the number of operations, which is not necessarily the same as the number of patients operated on. <table><tr><th>Diagnosis</th><th>ICD-10 code</th><th>Surgical procedures*</th></tr><tr><td>Inguinal hernia</td><td>K40.2, K40.9</td><td>JAB</td></tr></table> Each operation was assigned to the patient's region of domicile. *Code for Surgical procedures (Swedish version of NOMESCOs classification of surgical procedures 1.9)	Diagnosis	ICD-10 code	Surgical procedures*	Inguinal hernia	K40.2, K40.9	JAB
Diagnosis	ICD-10 code	Surgical procedures*					
Inguinal hernia	K40.2, K40.9	JAB					
Data sources	Patient Register, Swedish Centre for Epidemiology (EpC), Swedish National Board of Health and Welfare (NBHW),						
Sources of error	Reporting to the Patient Register is incomplete, particularly when it comes to dropout in outpatient care. That may partially influence the results. Dropout in some regions is due to the failure of private caregivers to report to the register. Because some county councils have system errors, their intervention codes were not reported at the time of the care event.						

Quality and Efficiency in Swedish Health Care Regional Comparisons 2007

This is the second report in a series called Quality and Efficiency in Swedish Health Care – Regional Comparisons. The series compares healthcare quality and efficiency in the 21 Swedish county councils and healthcare regions by using a set of national performance indicators. The first report was published in 2006 and the second in October 2007.

One purpose of the comparisons is to inform och stimulate the public debate on health care quality and efficiency. A second purpose is to stimulate and support local and regional efforts to improve health care services, both in terms of clinical quality and medical outcomes, and in terms of patient experience and efficient use of resources.

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