

An Evaluation of Swedish Health Economics Research

2006



SWEDISH COUNCIL FOR WORKING LIFE
AND SOCIAL RESEARCH

An Evaluation of Swedish Health Economics Research

conducted by

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February 2006



SWEDISH COUNCIL FOR WORKING LIFE AND
SOCIAL RESEARCH

Preface

In January 2005 the Swedish government commissioned the Swedish Council for Working Life and Social Research (FAS) to carry out an analysis of Swedish health economics research. The analysis should include an inventory as well as an evaluation of research carried out in the area. The evaluation should pertain to both the scientific quality and the policy relevance of the research. The evaluation was to be reported to the government by February 28, 2006.

The group of international experts in the area of public health selected to carry out the evaluation included Professor Michael Drummond (chair), Centre for Health Economics, University of York, UK; Professor Grete Botten, Director of the Department of Health Management and Health Economics, University of Oslo; Research Professor Unto Häkkinen, Centre for Health Economics, National Research and Development Centre for Welfare and Health (STAKES), Finland and Professor Kjeld Møller Pedersen, Institute of Public Health, Health Economics Unit, Syddansk Universitet (Odense), Denmark.

A Swedish reference group has advised on various aspects of the evaluation process. One member of this group, Professor emer Björn Smedby, has also written a brief history of Swedish health economics research together with Dr Marianne Hanning (section 2.2). Marianne Hanning has acted as an advisor to the evaluation group and has also been responsible for summarizing the results of the inventory surveys (section 4, Appendices B and C). Professor Olle Persson, Department of Sociology, Umeå University, has assisted the evaluation group by carrying out bibliometric analyses, which he has described in section 5. Ms Kerstin Carsjö, Research secretary, has been in charge of the planning and the administration of this evaluation at FAS and is responsible for section 3 as well as Appendices A, D and E.

A seminar will be arranged in April 2006 at which all the researchers who participated in the inventory and evaluation will be provided with an opportunity for discussion and comments on the reports.

FAS would like to thank the international evaluation group, the Swedish reference group and all the participating researchers for their contribution to the successful completion of this evaluation.

Stockholm in February 2006

Rune Åberg

Secretary General of the Swedish Council
for Working Life and Social Research

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Foreword

This report is the presentation of the descriptions, observations and recommendations made by the international panel evaluating Swedish health economics research (HER).

As part of a government assignment to evaluate HER, the Swedish Council for Working Life and Social Research (FAS) appointed an international panel to conduct an external and independent evaluation. The evaluation took place from August 2005 to January 2006.

Evaluations may have different goals. This evaluation does not rank Swedish HER departments according to certain criteria, but is of a more strategic nature aimed at providing the Swedish government with internationally independent observations and recommendations to help develop future research policy. Although the evaluation does not aim to rank institutions, references to certain departments or research groups mentioned in the evaluation report illustrate examples of good practice of, or weaknesses in, HER.

The evaluation is based upon written material provided by and produced by the various research units and FAS, and a number of interviews. Swedish research departments have provided descriptions and opinions. The panel has conducted a number of interviews with researchers and various policy makers. A bibliometric survey was conducted by Olle Persson of Umeå University, and we were supported by a reference group of senior Swedish academics. The panel would like to express its gratitude to all those Swedish departments and individuals who have spent time on providing valuable material and information to the panel evaluation.

The FAS secretariat has been supportive of the evaluation panel during its work. The panel would like to express special thanks to Kerstin Carsjö for her continuous support to the panel and to Marianne Hanning for acting as our advisor and for providing descriptive material from the research departments.

All members of the panel agree with the opinions expressed in this report.

The panel submits its report to FAS for further consideration.

Michael Drummond, Chair
United Kingdom

Grete Botten,
Norway

Unto Häkkinen,
Finland

Kjeld Møller Pedersen,
Denmark

1. Executive summary

In its directives to the Swedish Council for Working Life and Social Research (FAS) for 2005, the government gave FAS a commission to evaluate Swedish research in the area of health economics. The commission was formulated as follows:

FAS should carry out an analysis of Swedish health economics research. The commission includes an inventory as well as an evaluation of research carried out in the area. The evaluation should pertain to both the scientific quality and the societal/policy relevance of the research. The evaluation should be reported to the government by February 28, 2006.

FAS began by setting up a small Swedish reference group to consult with in the planning of the evaluation. The Swedish reference group has consisted of Björn Smedby, Professor emeritus of Health Services Research, University of Uppsala and Stig Wall, Professor of Epidemiology and Health Care, University of Umeå. At an early stage Olle Persson, Professor in Library and Information Science at University of Umeå, was appointed to carry out bibliometric analyses. Also, Marianne Hanning, PhD in Health Services Research from University of Uppsala, was engaged by FAS to act as an advisor to the evaluation group and assist with the compilation and analysis of results from the inventory survey.

The reference group has contributed to evaluation process in several ways. Björn Smedby and Marianne Hanning have written a description of the development of health economics in Sweden from the 1960's to the 2000's (see section 2.2). The reference group has given advice on the contents of the inventory survey including names of recipients and was also instrumental in the selection of members of the evaluation group.

The international evaluation group appointed to carry out the evaluation consisted of the following members:

- Professor Michael Drummond, Centre for Health Economics, University of York, UK
- Professor Grete Botten, Director, Dept of Health Management and Health Economics, University of Oslo
- Research Professor Unto Häkkinen, Centre for Health Economics, National Research and Development Centre for Welfare and Health (STAKES), Finland
- Professor Kjeld Møller Pedersen, Institute of Public Health, Health Economics Unit, University of Southern Denmark (Odense)

Professor Michael Drummond acted as chair of the evaluation panel. The group met twice in Stockholm. At the first meeting in August 2005 the objectives and results of the inventory were presented and the procedure for the remaining part of the evaluation was drawn up. The second meeting in December 2005 included interviews with decision-makers and research groups as well as a drafting of preliminary conclusions and recommendations.

The evaluation group agreed on a definition of health economics, which in a short form was as follows: *health economics is the application of theoretical or empirical economic analysis of health or health care using standard or specifically developed techniques from economics*. The full description can be found in on page 16 in section 3.2. The definition also included a number of specific research areas, which were used for the analysis of Swedish health economics research.

The evaluation is based on the following material:

- inventory survey to 36 university research units/government authorities
- follow-up survey to 13 university research units
- five best and most representative publications submitted by 13 research units
- bibliometric analysis of Swedish health economics literature
- interviews with representatives of 11 policy-makers and administrators as well as 13 research group representatives.

The first inventory survey was carried out in the spring of 2005 and was sent out to 36 university research units and government authorities. It included questions on the units' health economics research programme, research budget, training courses, key achievements, applied contributions, research collaboration as well as future developments of research. Twenty-four units returned completed questionnaires. The remainder sent in incomplete responses or replied that they did not carry out health economics research.

At the request of the evaluators a second, follow-up survey was sent out to 13 university research units with more extensive health economics research. This survey included questions on inflow and outflow of PhD's, sources of external funding as well as an updated list of publications indicating the five most important ones from a point of a) scientific quality and b) policy relevance. Respondents also submitted copies of the research units' five best and most representative publications, which were sent out to the members of the evaluation group.

Five appendices to the report include: A. Two survey questionnaires and information on response; B. Detailed description of the research units; C. List of 46 dissertations in Swedish health economics 2000-; D. List of 61 submitted publications and E. List of participants in interviews

In the bibliometric studies the number of publications, citations and impact of Swedish health economics literature were analyzed using data from the Web of Science. Several different bibliometric data sets gave similar results regarding the international standing of Swedish health economics. Although being a small country, Sweden was on rank 5 when it came to paper output. The citation impact of the Swedish papers was also at a high level and somewhat higher compared to the paper output.

Overall evaluation and conclusions

In assessing the contribution of Swedish health economics research, both research quality and policy relevance were considered to be important. The criteria for assessing research quality were easier to define, since the quality of individual papers is highly correlated with the quality of the journals they are published in. Therefore, in the bibliometric survey the assessment of the contribution of Swedish health eco-

nomics research was based on publications in the top two journals in the field, the *Journal of Health Economics* and *Health Economics*.

The articles submitted by the research units were classified according to the areas of health economics research outlined in the definition used:

- A. What influences health (other than health care)?
- B. What is health? What is its value?
- C. Demand for health care
- D. Supply of health care
- E. Micro-economics evaluation at treatment level
- F. Market equilibrium
- G. Evaluation at whole system level
- H. Planning, budgeting and monitoring mechanisms

The idea behind this systematic presentation was not to evaluate the submitted papers in detail, but to present a picture of research carried out in order to convey an idea of the coverage and quality of Swedish health economics research.

The criteria for assessing policy relevance were much harder to specify and measure. It is generally not possible to seek independent data on the policy relevance of research, so the evaluation team relied mainly on the comments provided by the research groups themselves, supplemented by comments from the decision-makers that were interviewed.

Overall, the immediate policy relevance of the research does not appear high, either because policy relevance has not appealed to, or been a success criterion, for the researchers, or because the authorities have not commissioned much of this type of research. Economic evaluation is the exception to the rule. The policy relevance is clear and much research has been commissioned, by, for instance, pharmaceutical companies. However, overall the theoretical and empirical level of Swedish health economics research is high, and in some areas it is leading the field.

The evaluators' overall impression of Swedish health economics research was very positive. In making the assessments and conclusions the evaluators were, of course, influenced by how the sub-discipline has developed in their own countries. Many features are similar, such as the mixture of theoretical and empirical research in major fields such as economic evaluation. It is clear that Sweden is one of the world leaders in this topic. Perhaps the most striking difference between Sweden and the evaluator's own countries is the relative lack of research into the 'big-picture' issues facing all health care systems, such as how to allocate resources equitably, how to measure the efficiency of the system and how to increase incentives. In the evaluators' countries the ministry, or those responsible for providing health care (e.g., county councils), commissions research into these topics from academic institutions, but this appears not to be the case in Sweden

Both researchers and decision-makers felt that there was a scarcity of trained health economist researchers. The reasons for this are probably multi-faceted. The evaluation team noted that there was only one masters programme in Sweden, which itself was established only in 2003. (By comparison the first masters programme in the UK was established in 1977.) There are several PhD programmes, based in eco-

nomics or health sciences departments, allowing a specialism in health economics, but the output of these is variable, owing to limited funding. In addition, in PhDs based in health sciences departments, the formal training in health economics and econometrics is somewhat limited, so the graduates of these programmes may not be able to undertake some kinds of health economics research.

Another reason for the lack of trained researchers in the public sector is the lack of career progression. Those with PhDs find it difficult to obtain post-doctoral positions and junior faculty posts. By contrast, a major beneficiary of the PhD programmes has been the pharmaceutical industry, which has employed a substantial number of the graduates.

Some health economics teaching and research activities are located in economics departments, others in health sciences centres. Each location for health economics has its advantages and disadvantages. In an economics department, health economics is close to its ‘mother discipline’ and there is greater opportunity for theoretical work. In a health sciences centre, multidisciplinary work is encouraged and the acceptance of health economics among the clinical disciplines is increased. The health economist is also closer to the ‘sharp end’ of health care delivery. A balanced national programme in health economics would ideally embrace both types of institutional arrangements. An even better situation would be the development of organizational structures that enable health economists to have links with both economics and health sciences.

In general, Swedish health economics researchers have been fairly successful in attracting funds to support their activities. However, the vast majority of funding relates to projects and/or other short-term activities, rather than being secure long-term funding. This imparts a certain fragility to the whole teaching and research activities in health economics in Sweden.

Health economics research makes considerable use of register data. The evaluation team noted several such examples in Sweden but, given the existence of good register data, we felt that this was an area to be exploited further.

Some health economics groups, such as LUCHE in Lund and Stockholm School of Economics/Karolinska Institute in Stockholm, have developed collaborative networks. This is to be encouraged, especially in the case of the small health economics groups.

International collaboration is also important, given the similarities in health care resource allocation issues worldwide, and the potential for learning new methodological approaches. There were several examples of fruitful international collaboration among the Swedish centres.

Recommendations

1. Training and career progression

Encouragement should be given for the expansion of masters programmes in health economics. However, those institutions developing programmes should be encouraged to collaborate with one another, in the interests of delivering high quality courses.

More funding should be given for post-doctoral research in health economics. Consideration should also be given to establishing a PhD Research School, so as to enable more students to gain access to the highest level tuition.

2. *The infrastructure of innovation*

Efforts should be made to establish at least one major research centre in health economics, with links both to a high quality department of economics and a health sciences centre. Initially, programme funding should be made available for one or more centres to build up expertise to enable them to compete in the 'Centres of Excellence' competitions organized, from time-to-time, by the research councils.

3. *Funding*

Efforts should be made to secure more long-term funding for health economics. This could be achieved by universities creating more tenured positions, or by the research councils or government agencies offering programme funding.

4. *Quasi-experimental research*

Health economics researchers should be encouraged to make more use of the high-quality data registers available in Sweden. They should also be encouraged to develop new methods for the analysis of register data and to improve on the content of registers. There will be a national call for proposals soon and the potential for submissions from health economics researchers is high.

5. *A health economics research agenda responsive to policy*

The connections between health economics researchers and decision-makers, at both local and national levels, should be strengthened. The mechanisms for achieving this could include:

- holding more annual national health economics conferences, bringing together researchers and policy makers at national and local levels;
- specifically funding research in areas where Swedish researchers have not been very active to date.

6. *Industry contribution*

Given the benefits it receives from the availability of trained health economists in Sweden, the Swedish-based health industry (i.e. pharmaceutical companies) should be encouraged to make a financial contribution to the training of health economists (e.g., through PhD fellowships and post-doctoral fellowships).

2. Background

2.1 Government briefing

In its directives to the Swedish Council for Working Life and Social Research (FAS) for 2005, the government gave FAS a commission to evaluate Swedish research in the area of health economics. The commission was formulated as follows:

FAS should carry out an analysis of Swedish health economics research. The commission includes an inventory as well as an evaluation of research carried out in the area. The evaluation should pertain to both the scientific quality and the societal/policy relevance of the research. The evaluation should be reported to the government by February 28, 2006.

2.2 The development of health economics in Sweden

Health economics as a sub-discipline in economics had its origin in the strong growth of health services and the explosion of health care costs that most Western economies experienced after the end of World War II. There was a need for theories and methods which could be used to analyze the development in the health sector and to provide guidance for decisions on how to fund, organize and allocate the health care resources in an efficient way (Arrow, 1963). The USA and the UK were the leading nations in developing health economics research.

2.2.1 The early days

In Sweden, the first study with a health economics approach was a licentiate dissertation at Lund University by Sven Rydenfelt in 1949 (Rydenfelt, 1949). It was not until 1966, however, that another Swedish study in this field was published by Jan-Erik Spek, a researcher at the Göteborg School of Economics (Spek, 1966). Published as an appendix to a health care plan for the city of Göteborg, he presented a description of the Swedish health care system and its development in 1950-65, which included an analysis of the concepts of demand, need, and efficiency of health care. The report also recommended further research on the assessment of demand and need for health care, in order to improve health planning efficiency. In 1969 Spek published another article, in which he outlined the possible applications of economic research to health and medical care (Spek, 1969). It also included a review of health economics research in England and the USA.

There are several early examples of Swedish research with a health economics approach in a broad sense done by physicians and researchers from different disciplines and universities (e.g. Peterson et al, 1967; Smedby, 1967; Mattson, 1968; Lindholm, 1973). However, the main beginning of health economics as a research area came in the 1970's. There were mainly two units involved: the Department of Economics at Lund University and the Department for Public Administration and Management at the Stockholm School of Economics.

2.2.2 The set-out in the 1970's

Health economics as an academic research field was established at the Department of Economics at Lund University in the early 1970's by a group around professor Ingemar Ståhl. In 1976 Bengt Jönsson defended his dissertation "Cost-benefit analysis in public health and medical care" (Jönsson, 1976) and in 1981 Björn Lindgren published his dissertation on cost of illness in Sweden (Lindgren 1981). An even earlier dissertation with a health economics perspective was published in 1974, however, by Lars Borgquist at the Department of Business Administration at Lund University. It dealt with organizational levels of the health services illustrated through a study of hip fractures among elderly persons (Borgquist, 1974).

The research in Lund initiated a privately funded institute, first called the Institute for Sociomedical Economics (ISE), with the aim of supporting the research and giving the researchers a platform for a future career. In 1979 it became the Swedish Institute for Health Economics (IHE). The founders were the two Swedish associations for the pharmaceutical industries (Association of Swedish Pharmaceutical Industry and the Association of Representatives for Foreign Pharmaceutical Industries). In 1988 the National Corporation of Swedish Pharmacies took over the ownership of IHE. With yearly national conferences, a widespread newsletter and a network for researchers and administrators working in the field, IHE has over the years had a clear influence on the development and dissemination of health economics in the Swedish health care sector.

In the mid 1970's a group of physicians, economists and health administrators met for informal discussions about resource allocation in health care, priority setting and the need for integrating medicine and economic research into the health services. The initiative to these discussions came from Thomas Thorburn, an economist and professor at the Stockholm School of Economics, and Ragnar Berfenstam, a professor of social medicine in Uppsala. These discussions grew into a series of seminars held in Stockholm during 1977 and 1978, which resulted in a booklet published by Spri, the Swedish Planning and Rationalisation Institute of the Health and Social Services (Berfenstam et al, 1979). The publication was titled "Hälsoekonomi". This seems to have been the first use of this term in Swedish. Earlier this field had been called "sjukvårdekonomi" or "hälso- och sjukvårdsekonomi".

In the booklet the seminar group argued for a broad approach to health economics. Health economics in the Swedish context should aim at applying knowledge that at that time was dispersed over several sciences and research fields. On the basis of integrated multi-disciplinary knowledge, health economics should provide the impetus for applied research on the essential problems of measurement and evaluation of resource inputs at different levels and identification of the total effects of these.

Founded in 1968 by the Government and the Federation of County Councils, Spri was also an important actor in the introduction of health economics in Sweden. In 1971 the institute published a report called "Methods for measuring medical care demand" (Spri, 1971) and in 1972 two articles on efficiency and measures of efficiency were published in *Läkartidningen* (Jonsson & Jonsson, 1972a and 1972b). One of the authors, Egon Jonsson, would later defend a PhD thesis at the Stockholm School of Economics (Jonsson, 1980). In 1984 he became an adjunct professor in health economics at the Karolinska Institute in Stockholm.

In 1977 the Swedish Medical Research Council (MFR) took an initiative to stimulate research on the need and demand for medical care and on what was called "medical care efficiency". A small unit was created within the MFR for stimulating health services research (hälso- och sjukvårdsforskning in Swedish). Björn Smedby and Göran Sterky were employed by the MFR with a main task of doing own research but also to try to get health services research projects started which could be funded by the MFR, including health economics research. Smedby was a physician in social medicine and Sterky a public health oriented paediatrician. Later three other researchers were added to the unit, Stig Wall, a statistician, Monica Johnsson, an economist, and Bengt Brorsson, a sociologist.

2.2.3 The 1980's – a promising future

In 1982 Bengt Jönsson moved to Linköping University as the first Swedish professor of health economics in a new department called Health and Society. From 1985 he was also director of the Centre for Medical Technology Assessment at Linköping (CMT). Thus, Linköping University became the third academic place with health economics as a subject for research and education. Bengt Jönsson was followed by Lars Söderström and later by Lars Borgquist.

The MFR unit for health services research initiated projects in several areas but soon concentrated on medical technology assessment. In 1981 a group of economists with similar interests was also formed at Spri, and in the same year the MFR and Spri started cooperation on a series of Consensus Development Conferences and State-of-the-art Conferences as part of their medical technology assessment programme. In these conferences health economists always participated in the panels. The MFR also published a methodological review on medical technology assessment written by Stig Wall and Bengt Brorsson which seems to have had an impact on the field (Brorsson & Wall, 1985). The medical technology assessment activities of MFR and Spri in 1987 grew into what is now called The Swedish Council on Technology Assessment in Health Care (SBU), an independent government institution since 1992. Its first director was Egon Jonsson.

Health economics soon became a topic for research training courses, and the first course was given in Lund as a part of a PhD programme in economics. There were also courses given at medical faculties within the programmes for health services research. International input was important for this activity and Professor Alan Williams from York University was often the main teacher. He was awarded an honorary doctorate at Lund University in 1977.

2.2.4 The 1990's – expansion and consolidation

In the 1990's health economics was further strengthened as an academic discipline. Very important was the establishment of the Centre for Health Economics at the Stockholm School of Economics. In 1991, Bengt Jönsson was appointed professor and director of the centre. The research at the centre has been extensive and internationally well renowned. During recent years the centre has also started close cooperation with the medical faculty at the Karolinska Institute.

At Lund University the 1990's were years of consolidation and expansion. As a result of the establishment of an externally financed chair at the Department of Community Medicine Björn Lindgren became professor in 1991. Another chair at the same department, financed by grants from the National Institute for Public Health, was established in 2001 for Ulf G Gerdtham. Research and training in health economics was also conducted at the Department of Economics, as well as at the Institute of Economic Research. Since 1998 all the groups involved in health economics research in Lund are cooperating under the heading of Lund University Centre for Health Economics (LUCHE).

2.2.5 From 2000 – diffusion and multi-disciplinary cooperation?

Over the last ten years health economics has developed forcefully and a number of active research environments have been set up at most of the Swedish universities, both at departments of economics and at medical faculties. Health economics has also become part – even if only minor – of the basic curriculum for medical and health care science students.

A core issue in the Swedish health economics research has been methods for economic evaluations of different treatments, especially pharmacotherapy. Many health economists have found employment at a pharmaceutical company and also been able to do some research there. The establishment of the Pharmaceutical Benefits Board in 2002 has been influential for a rising interest in and use of economic evaluations for decision making in this area.

One important contribution to the diffusion and use of health economics during recent years is the Vårdal Institute. The institute was established in 2002 as a virtual institute for research, development and communication on health and social care. The institute has financial support from the Vårdal Foundation, the Universities of Lund and Göteborg and the regions of Västra Götaland and Skåne. The research is multidisciplinary and senior researchers and PhD students come from all over the country. Health economics is an integrated part in the education of the researchers as well as in many of the research projects.

Swedish health economics researchers have over the years also had substantial cooperation with researchers in other countries as well as taking an active part in the international meetings. In 1995, the health economists at the Stockholm School of Economics and Lund University joined forces to arrange the 3rd European Health Economics Meeting and Bengt Jönsson was president of the International Health Economics Association in 2004-2005.

2.2.6 Some concluding comments

There is no single definition of health economics and its area of research is difficult to circumscribe. It is an interdisciplinary field covering several specialized areas and skills. In these respects health economics is similar to health services research in general. These two fields overlap to a great extent. This is obvious from the content of the first two international bibliographies of health economics, which were published in 1977 and 1980 (Culyer, Wiseman & Walker 1977; Griffiths et al, 1980).

At the very beginning there was less cooperation between Swedish health economists working at departments of economics and health services researchers based in medical faculties. One initiative which brought researchers in these fields closer together was the establishment in 1978 of a Nordic Planning Group for Health Services Research supported by the Swedish Medical Research Council. In this group there was active involvement by health economists from all the Nordic countries. It served mainly as a discussion group but some Nordic research projects in health economics were initiated and a series of Nordic Health Policy Forums was arranged.

Another initiative, mainly to strengthen health economics as a genuine economics discipline, was taken by economists at Bergen, Helsinki, Lund and Odense

Universities. In 1980, the first Nordic Health Economists' Meeting was held in Lund. Since then annual meetings have circulated among the five Nordic countries.

In Sweden, contrary to the other Nordic countries, the development of health economics and health services research might be described as having run partly parallel with each other. Both have developed into disciplines with academic positions. Health economics seems to have consolidated its position more than other health services research, which has been fragmented into several more or less independent research areas such as technology assessment, outcomes research, studies of quality of health services and inequality in health. In a recent international evaluation of Swedish public health research initiated by FAS (Kamper-Jørgensen et al, 2005), this fragmentation of health services research was described and its later development judged as weak. It may be seen as a positive sign that over the years health economists and other health services researchers seem to be working more closely together.

3. The process of evaluation

FAS began by setting up a small Swedish reference group to consult with in the planning of the evaluation. The Swedish reference group consisted at first of Björn Smedby, Professor emeritus of Health Services Research, University of Uppsala and Stig Wall, Professor of Epidemiology and Health Care, University of Umeå. At an early stage Olle Persson, Professor in Library and Information Science at University of Umeå, was appointed to carry out bibliometric analyses. Also, Marianne Hanning, PhD in Health Services Research from University of Uppsala, was engaged to assist with the various aspects of the evaluation, mainly to analyze and describe the results of an inventory survey.

3.1 International evaluation panel

One of the tasks of the Swedish reference group was to give advice on the selection of a group of international experts in health economics to carry out the *evaluation*. The group had to be recruited outside of Sweden to reduce the potential for conflicts of interest. However, it was also considered advantageous to include experts from the Nordic countries with ability to read Swedish language publications. In addition to geography, gender aspects were also considered. Also, the expertise of the group naturally had to cover the various research areas of health economics. The international panel has consisted of

- Professor Grete Botten, Director of Department of Health Management and Health Economics, University of Oslo, Norway
- Professor Michael Drummond, Centre for Health Economics, University of York, UK
- Research Professor Unto Häkkinen, Centre for Health Economics, National Research and Development Centre for Welfare and Health (STAKES), Finland
- Professor Kjeld Møller Pedersen, Institute of Public Health, Health Economics Unit, University of Southern Denmark (Odense).

Professor Michael Drummond acted as chair of the evaluation panel. The group met twice in Stockholm. At the first meeting in August 2005 the objectives and results of the inventory were presented and the procedure for the remaining part of the evaluation was drawn up. The second meeting in December 2005 included interviews with decision-makers and research groups as well as a drafting of preliminary conclusions and recommendations.

3.2 Definition of health economics

At its first meeting in August 2005, the international evaluation group initiated a discussion on a definition of the area of health economics. The group later came to an agreement to use the following definition for the evaluation:

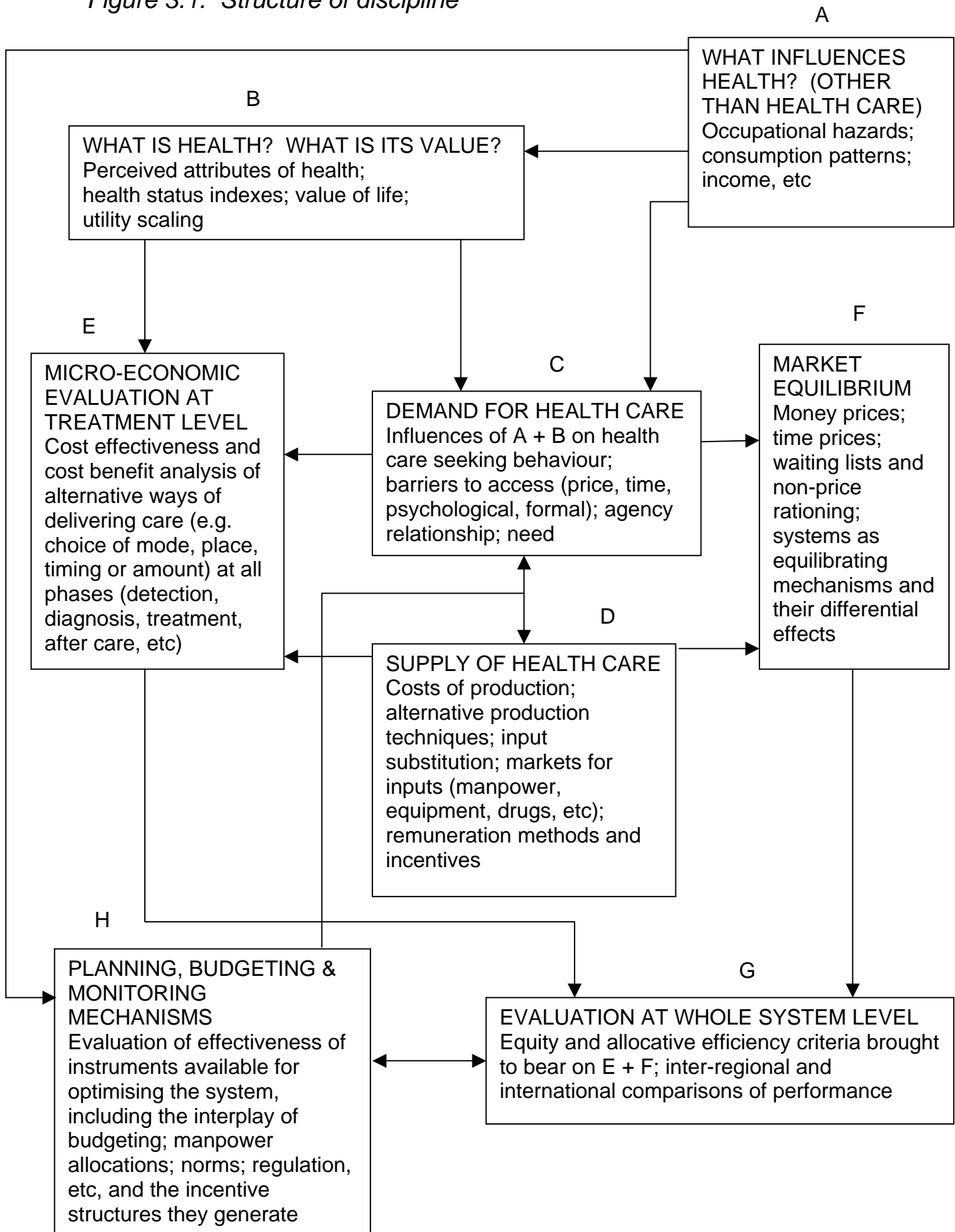
Health economics is a 'sub-discipline that has evolved out of its parent discipline (economics) in an uneven manner' (Maynard and Kanavos, 2000). Hence, health economics is the application of theoretical or empirical economic analysis of health or health care using standard or specifically developed techniques from economics.

Williams (1987) has described health economics as a number of specific areas of research with linkages between them (see Figure 3.1). The boxes A, B, C and D are the disciplinary 'engine room' of health economics, while the boxes C, F, G and H are the main empirical fields of application, for whose sake the engine room exists. This is not, of course, to deny that the first four boxes contain material that is of substantial interest in its own right. They also contain empirical, as well as methodological, work.

This 'definition' of health economics, based on the types of research that health economists undertake, is adopted in this project, with one caveat, cf. above.

The caveat is that, to be considered health economics, research in any of the areas outlined in Figure 1 needs to adopt a theoretical and/or empirical perspective consistent with the parent discipline (economics). Thus, in considering Box A in Figure 1, an epidemiological survey of the determinants of health would not qualify unless it was based on an economic theory of the production of health and/or used relevant econometric techniques for the analysis of the data. Similarly, in considering Box B, measurements of clinical outcomes would not qualify unless there was exploration of the value of various outcomes and the trade-offs between them.

Figure 3.1. Structure of discipline



3.3 Objectives of the evaluation

As mentioned above, the commission given to FAS was to conduct an evaluation which should include both an inventory and an evaluation of research carried out in the area of health economics. Furthermore, the evaluation should pertain to both the scientific quality and the societal/policy relevance of the research.

The evaluation group discussed at length the task of evaluating scientific quality of research in the area. The evaluators agreed on an approach which aimed at benchmarking Swedish health economics research (as a whole) on the international level rather than a ranking of individual research units.

3.4 Evaluation procedure

In consultation with the reference group FAS decided to begin by conducting an inventory survey of research institutions involved in health economics research as well as a bibliometric analysis of Swedish research literature in the area.

3.4.1 Surveys

The first survey, also referred to as the inventory survey, was carried out in May-June 2005. The survey questions covered such areas as the research units' research programme, research budget, training courses, key achievements, applied contributions, research collaboration as well as future developments of research, all with reference to the special area of health economics. Respondents were also asked to list the publications from the unit in the area of health economics during the past five years (i.e., from 2000 on). The list was to be divided into a) publications in refereed journals and b) other publications.

A total of 36 questionnaires were sent out by e-mail to Swedish research units as well as some relevant government authorities. The selection of research units to be included in the inventory survey was made on the following bases: 1) Suggestions by the reference group, in combination with results of preliminary bibliometric searches in Web of Science and 2) Lists of members of two networks in the area, namely a network of health economists in the Stockholm area and the Nordic Health Economists' Study Group. Twenty-four units returned completed questionnaires. The remainder sent in incomplete responses or replied that they did not carry out health economics research.

The results of the inventory survey and preliminary bibliometric analyses were presented to the evaluation group at its first meeting in August 2005. The international evaluators discussed the need for additional information for the evaluation and agreed on the following:

- a follow-up survey to collect information on inflow and outflow of PhD's, sources of external funding as well as an updated list of publications indicating the five most important ones from a point of a) scientific quality and b) policy relevance
- in connection with the follow-up survey a submission of four copies of the research units' five best and most representative publications
- additional bibliometric analyses based on the submitted publications.

The follow-up survey was carried out in September 2005. This questionnaire was not sent to all 24 research units which had responded to the inventory survey. Government authorities and some units with less extensive health economics research were excluded resulting in 13 research units, all of which replied to the second survey.

All publications submitted by the 13 research units were sent for reading to the four members of the evaluation group. The inventory and follow-up questionnaires, including publication lists, from the 13 main research groups were also sent to the evaluation group.

The results of the surveys are described in section 4 of this report. The questionnaires, mailing lists and responses to the inventory and follow-up surveys can all be found in Appendix A. A detailed description of the research units involved in health economics at Swedish universities can be found in Appendix B. In Appendix C the last five years' PhD dissertations from the research units included in the follow-up are listed by university unit, PhD's name, dissertation title, discipline of the student's basic training and year. The publications submitted by the research units included in the follow-up have been listed in Appendix D.

It should be mentioned that all researchers participating in the follow-up survey have been given the opportunity to review and correct the descriptions of their respective research units before publication of this report.

The revised publication lists received in the follow-up were sent to Olle Persson for bibliometric analyses, which have been described in Section 5 of this report.

3.4.2 Interviews

In addition to the information from the surveys, the evaluation group expressed an interest in meeting with policy/decision-makers and administrators from government agencies to discuss their views on Swedish health economics research. Two groups were interviewed on the first afternoon of the December 2005 meeting in two two-hour sessions. The first group consisted of six representatives of national and regional governments. The second group consisted of five representatives of government authorities. All members of the evaluation group were present at the interviews. A list of the participants in these discussions can be found in Appendix E.

Ahead of the interviews, the participants had been asked to prepare a brief presentation of themselves and their organization. The participants had also received a list of questions from the panel beforehand. Examples of questions to policy/decision-makers and administrators included:

- Please explain the role of your institution/office
- How do you use research and reviews in your institution/office?
- Please give some examples where you consider the use of research in your institution a success – also explain if research results were used directly or in a more indirect way
- Please give some examples where your attempts to apply research results were unsuccessful – why were they unsuccessful?
- Is your staff – or some of your staff educated to do research themselves?

- Do you commission or buy research yourself outside your own organization?
- If yes, please give examples on the procedure you use in such cases?
- Do you feel you get what you need from the research community to run your own institution?
- Do you influence Swedish research policy or Swedish research programmes directly or indirectly?
- Please tell us about your communication with researchers.

The evaluation group also met with some researchers in person on the second day of the December meeting in order to be able to follow up some issues in greater depth. The 13 research units were all invited to send representatives to these interviews. Four groups of 3-4 researchers were interviewed in 90-minute sessions by the evaluation group. A list of researchers interviewed can be found in Appendix E.

The researchers were asked to begin with a brief presentation of themselves and their research unit. The topics for the following discussion, which had been sent out beforehand included various aspects of

- *structure* (research structure and context, funding, manpower, leadership and management)
- *process* (programmes of research along the axes defined for the evaluation)
- *outcome* (publications, added social value, post-graduate studies, etc) and
- *future* (where do we go from here, future needs of research centres).

4. Inventory of Swedish health economics research

The first inventory survey was thus sent to university departments, research institutes and authorities involved in health economics research in Sweden. The follow-up was sent to the main health economics research units in September 2005. This section summarizes the results of these two surveys. The reader is referred to Appendix B for a detailed description of the research units.

In the first survey the units were asked about their researchers: number, position, educational background and to what degree they were engaged in health economics research. There was also a question about the units' health economics research budget during 2004. Activities in training and education were also asked for. Other questions addressed the research and included: main areas, key achievements and contributions to health policy development. Thereafter there was a question about the collaboration with other researchers or organizations – nationally as well as internationally. The last question addressed the unit's plans for the future development of their research in health economics. There was also an opportunity for the respondents to add information or to make any comments which they thought could be of relevance to the description of their unit or for the national evaluation of health economics research.

At the end of the survey the units were also asked to give a list of publications in the area of health economics from 2000 on.

There were 36 units in total on the mailing list. One unit at Mälardalen University College had heard about the evaluation and contacted FAS to get a questionnaire. In the end of June 2005, there was only one unit which had not replied. Seven units answered that they were not involved in any health economics research. Four units only completed the questionnaire partially, mostly by sending a list of published articles and reports which to some degree involved health economics. Thus, in summary, there are 24 completed questionnaires (19 university based units/research centres, four authorities, and one corporate research institute) in the analysis contained in this report (please refer to Appendix A for a detailed list of responses).

Based on the responses in the first survey 12 research units and one research institute (IHE) were selected for a follow-up on two issues; dissertations in the area of health economics from 2000 and sources of external funding in 2004. The units were also asked to go through the list of publications they previously sent in and indicate a) up to five of the most important health economics publications from the perspective of scientific quality, and b) up to five of the most important publications from a perspective of policy relevance from their units.

There was no definition of health economics research in the surveys. Thus, the units surveyed had to reflect over their own research and make a stand on whether they carried out any health economics research. This created some uncertainty among some of the responders, which is illustrated by the answer from the Nordic School of Public Health.

“It is difficult to answer these questions since health economics is not defined. We are doing research in the field of health management and focusing mainly on intersectional collaboration and the development of the Nordic welfare systems. We are not dealing with health economics in the narrow sense, although some people may think that we are doing research in this field.”

Växjö School of Economics was also uncertain if they could be considered doing health economics research. They do not have any special budget for this kind of research, but they have from time to time addressed health economics issues in their research on labour market and immigration. Karlstad University College is another unit which responded that their health economics research was minor.

Thus, the survey is not a complete description of all research in health economics in Sweden. There is research in the area conducted at other university units not covered here, as well as in private institutions, e.g., pharmaceutical companies. However, the work represented in the survey must be considered to cover the vast majority of health economics research in Sweden.

4.1 The organizational structure of Swedish health economics research

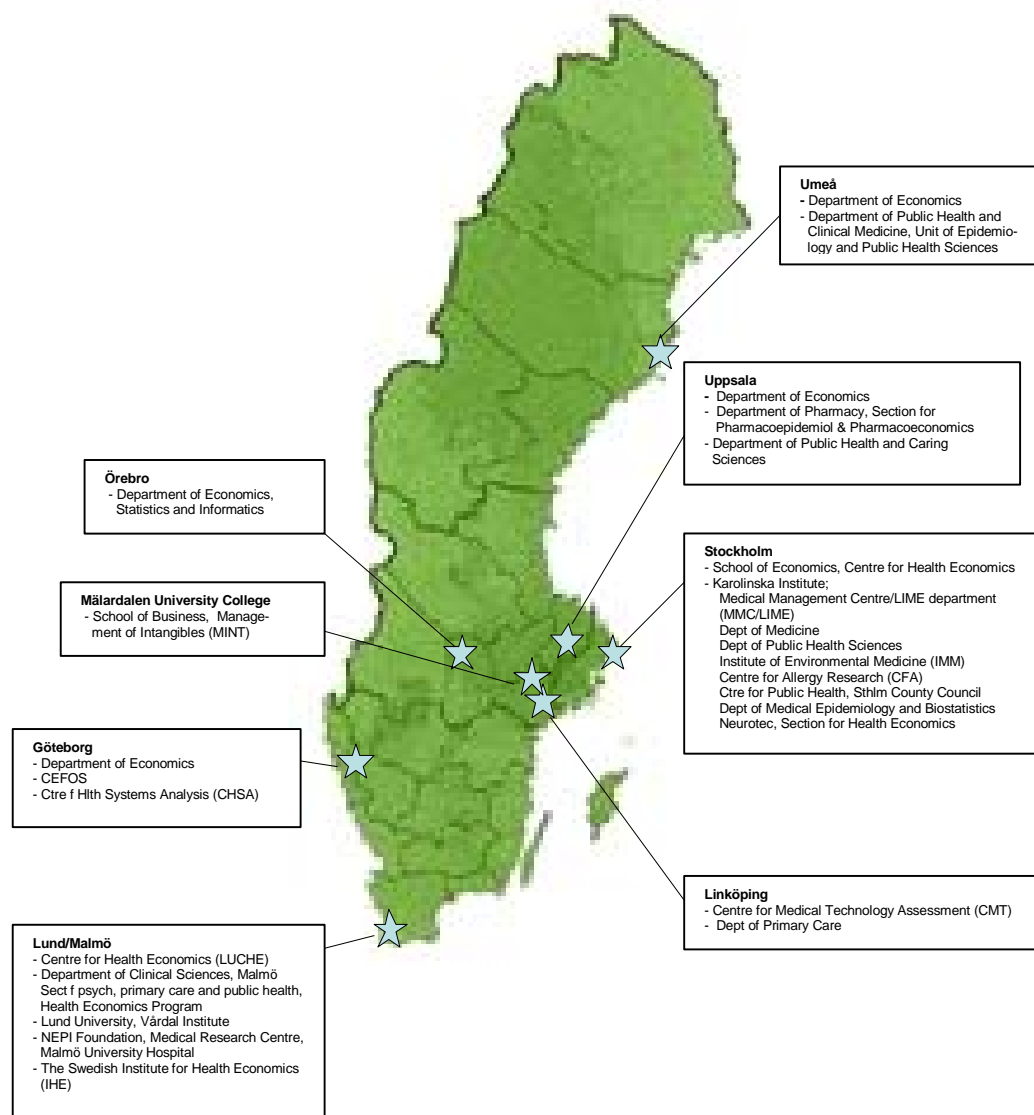


Figure 4.1 University units and research institutes covered in the survey

Health economics research is not only carried out at Schools of Business or university departments of economics. As the area is interdisciplinary in nature and a great deal of the research is applied, it is intrinsic that much of the research is also carried out at university departments in faculties of medicine. At most of the universities this has led to a close collaboration between the departments of economics and departments in medical faculties.

Another characteristic trait of health economics research is that it has close ties with the development of policy: it often forms a basis for different political decisions and policies regarding the management/administration of the health care system. Even if no actual research is carried out at the authorities responsible for health policy in Sweden, close cooperation exists between university research departments and the authorities in question.

The following four authorities also responded to the survey: National Board of Health and Welfare (Centre for Epidemiology), National Institute for Public Health, Swedish Council on Technology Assessment in Health Care (SBU) and the Pharmaceutical Benefits Board. The responses from the authorities are summarized in section 4.3.

4.2 University units and research institutes

4.2.1 Researchers

The total number of persons listed as working with health economics research in 2004 at the university units and the Institute for Health Economics (IHE) was 159. Of these, 85 had a PhD degree and 64 were PhD students. The majority of the remaining 10 persons worked as lecturers.

Among the PhDs, 60 had a degree in Economics, Health Economics, or, Business Administration, 17 had a degree from a medical faculty, and 9 had a PhD in another discipline¹. About 15 percent of the researchers with a PhD were women.

Of the PhD students 39 had a basic training in Economics, Health Economics or Business Administration, 6 had both a basic education in Economics and a medical discipline, 16 had a basic education in a medical discipline, and 3 have a basic training in other disciplines. About 47 percent of the students were women.

The reported total annual full-time equivalents for health economics research in 2004 was 85.5. The majority of the researchers only have a “part-time” engagement in health economics, and only 40 of the 159 researchers (17 of the PhDs, 20 of the doctoral students and 3 of the other researchers) worked full-time in health economics research.

¹ The question in the survey refers to the discipline in which the thesis was obtained, not to the discipline where the PhDs are currently employed.

Table 4.1 Number of researchers in different positions and their working time in health economics research (in full-time equivalents)

| Position/title | Number of researchers | Full-time equivalents |
|---|------------------------------|------------------------------|
| Professor/Associate professor/Adjunct professor | 46 | 15.2 |
| Lecturer/Research fellow | 49 | 31.3 |
| PhD student | 64 | 39.0 |
| Total | 159 | 85.5 |

4.2.2 Financial resources

Three of the 19 university based units have not answered the question on the size of the budget. Four replied that they do not have any specific budget or only have a very small amount of resources for health economics research. The total budget sum varies greatly among the others, from SEK 6.5 million to SEK 150 000. The total amount for 2004 was SEK 27.9 million (SEK 10.2 internal budget including salaries and fees and SEK 17.7 million in external grants after deduction for university costs). These figures must however be interpreted with caution, since it sometimes can be difficult to exactly separate between funding coming from external sources and the internal budget for labour, administration and teaching. Also, the external budget can vary substantially between different years.

The National Institute for Public Health had an internal budget of SEK 1.5 million and the external budget was SEK 2 million. The National Board of Health and Welfare had no internal budget but had an external budget of SEK 400 000. The Swedish Council on Technology Assessment in Health Care (SBU) had an internal budget of about SEK 70 000 and the Pharmaceutical Benefits Board answered that a certain amount of the time (between 5 and 20%) of the five employees involved in health economic research was set aside for their research work.

The Swedish Institute for Health Economics (IHE) had the highest budget of all the units in the survey, with a SEK 14 million turnover (60% coming from the public sector and 10-15% from research grants). However, part of their work is commissioned projects and, not pure health economics research. Also, in comparison to the university units, the budget for IHE includes overhead costs and other costs like education, etc.

4.2.3 Education and training courses

Academic courses in health economics are given at most of the universities participating in the survey. There are courses both at undergraduate (C-level) and graduate level (D-level). At the Economics Department of Lund University there is an integrated and structured masters programme in Health, Labour and Family, given regularly since 1992. Since 2003 there is a masters programme in Health Economics at the Karolinska Institute.

In Tables 4.2 and 4.3 the academic courses in health economics are shown.

Table 4.2 University courses – undergraduate and masters level

| Course | University | Credits* | Participants | Other |
|--|--|-----------------|--|--|
| Health economics I | Lund | 5 | Undergraduate (B/C-level) course in Economics | Started 1990 |
| Health economics II | Lund | 5 | Part of master and PhD programme in Economics | Started 1982. Given once a year since 1995 |
| Economic evaluation of technologies for health | Lund | 5 | Part of master and PhD programme in Economics | Given 1993,2001 and 2003 |
| Health economics | Göteborg | 5 | Undergraduate course in Economics | Started 2004/05 |
| Clinical effectiveness | Linköping/CMT | 15 | Mostly physicians | Interdisciplinary course including health economics. Given four times 1999-2004. |
| Health economic evaluation | Linköping/CMT | 5 | Economists, nurses, physiotherapists | Given once. Spring 2004 |
| Health economics | Stockholm School of Economics | 5 | Undergraduate and master degree students | Once a year |
| Health economics | Karolinska Institute | 40 | Masters in health economics | Since 2003 |
| Introduction to health economics | Karolinska Institute | 10 | Undergraduate | Since 2003 |
| Health economics | Karolinska Institute | 1 | Undergraduate | - |
| Applied health economics | Umeå, Dept of Economics | 5 | Graduate level | Spring 2005 |
| Health economics for nurses | Umeå, Dept of Economics | 5 | Undergraduate level | Twice a year 2003-2005 |
| Evaluation in public health | Umeå, Dept of Public Health | 10 | Graduate level | Annually since 2000. 80% from developing countries. |
| Health policy and health economics | Uppsala, Dept of Public Health and Caring Sciences | 5 | Undergraduate and graduate level. Physicians, nurses, physiotherapists | Twice a year since 1998 |
| Pharmacoepidemiology and pharmacoconomics | Uppsala, Dept of Pharmacy | 7 | Undergraduate and master level for pharmacists | Since 1996 |
| Pharmacoepidemiology and pharmacoconomics | Uppsala, Dept of Pharmacy | 5 | Master level for pharmacists | Since 1998 |
| Health and economics | Mälardalen University College | 30 | Master level course in health and profitability, accounting and management control | Since 2004 |

*) 1 Credit = one week of full-time studies.

Table 4.3 University courses – PhD level

| Course | University | Credits* | Other |
|--|-------------------------------|----------|--|
| Health economics II | Lund | 5 | Started 1982. Given once a year since 1995 |
| Economic evaluation of technologies for health | Lund | 5 | Given 1993, 2001 and 2003 |
| Handbook of health economics | Lund | 5 | Given 2003/04 |
| Health economics for health and social care. Theory | Lund/Vårdal Institute | 5 | Given three times 2004-05 |
| Health economics for health and social care. Empirical methods and studies | Lund/Vårdal Institute | 5 | Starts in 2006 |
| Health economics | Stockholm School of Economics | 5 | Every second/third year since 1995 |

*) 1 Credit = one week of full-time studies.

At Stockholm School of Economics there is also an Executive MBA programme in Health Service Management. Within this programme there is a 5-credit course in Health Economics.

The Department of Public Health and Clinical Medicine in Umeå has also reported that they have given two one-week courses in health economic evaluation and applied health economics in collaboration with Hanoi Medical University.

4.2.4 Dissertations

One of the follow-up questions sent to the selected university units (see Appendix A) concerned dissertations during the last five years. The units reported a total of 46 dissertations in the area of health economics. A few of these may not fall within a strict definition of health economics but have nevertheless been included. In Figure 4.2 the number of dissertations for each year is shown.

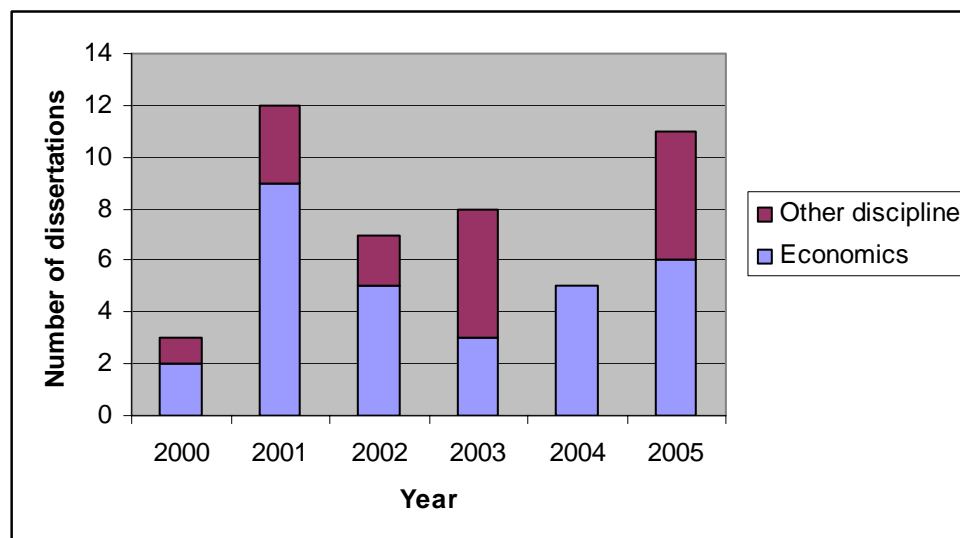


Figure 4.2 Dissertations in the area of health economics 2000 – 2005 (n=46)

Twenty percent of those receiving a PhD were women.

In Appendix C the dissertations are listed according to university unit, the PhDs' name, dissertation title, discipline of the student's basic training and year. This information is summarized below in Tables 4.4 and 4.5.

Table 4.4 Dissertations in the area of health economics at the different university research units 2000-2005

| University research unit | Number of dissertations |
|---|--------------------------------|
| Lund, LUCHE | 13 |
| Göteborg, Dept of Economics | 10 |
| Karolinska Institute | 10 |
| Stockholm School of Economics | 5 |
| Linköping, CMT* | 5 |
| Umeå, Dept of Economics | 1 |
| Umeå, Dept of Publ Health and Clinical Medicine | 1 |
| Uppsala, Dept of Economics | 1 |

*) Four of the PhDs were registered with the Tema H unit with supervision from staff at CMT

Table 4.5 The PhD students' dissertation discipline

| Discipline | Number of dissertations |
|--|--------------------------------|
| Economics | 32 |
| Public health/Social medicine/International health | 6 |
| Business administration/Managerial economics | 3 |
| Other discipline at medical faculty | 5 |

In the survey there were also questions about the current employment of those who had obtained a PhD. In Table 4.6 this information is summarized.

Table 4.6 Employment after examination

| Current employment | Persons | Thereof women |
|---------------------------------|----------------|----------------------|
| University* | 22 | 3 |
| Private business | 9 | 3 |
| Public administration | 8 | 1 |
| University and private business | 2 | - |
| IHE | 2 | 2 |
| IHE/University | 1 | - |
| Politics | 1 | - |

*) 4 persons were at universities abroad

4.2.5 Major research fields in Swedish health economics

By using the units' answers to the questions about their the current research programme and their major contributions to international front-line health economics, we have tried to classify their research in terms of the different fields included in the chosen definition of health economics. In Table 4.7 the number of areas has been limited to a maximum five areas which represent the most important research at the unit. All areas mentioned by the units are shown in Appendix B.

Table 4.7 Major research areas at the research units

| Research unit/organization | Major research areas |
|---|---|
| Lund University, LUCHE | <ul style="list-style-type: none"> - Demand for health care (C) - What influences health? (Other than health care) (A) - Economic evaluation of technologies for health (E) |
| Lund University, Dept of Clinical Sciences, Health Economics Programme | <ul style="list-style-type: none"> - What influences health? (Other than health care) (A) - Economic evaluation of technologies for health (E) - Evaluation at whole system level (G). |
| The Vårdal Institute | <ul style="list-style-type: none"> - Demand for health care (C) - What influences health? (Other than health care) (A) - Evaluation at whole system level (G) - Economic evaluation of technologies for health (E) |
| NEPI | <ul style="list-style-type: none"> - Economic evaluation of technologies for health (E) |
| IHE | <ul style="list-style-type: none"> - Economic evaluation of technologies for health (E) - Supply for health care (D) - Planning, budgeting & monitoring mechanisms (H) - Evaluation at whole system level (G) - Demand for health care (C) |
| Göteborg University, CEFOS | <ul style="list-style-type: none"> - Evaluation at whole system level (G) - Market equilibrium (F) <p>(The area of research is limited to sickness insurance systems and patient rights)</p> |
| Göteborg University, Dept for Economics | <ul style="list-style-type: none"> - What influences health? (Other than health care) (A) - What is health? What is its value?(B) - Demand for health care (C) - Economic evaluation of technologies for health (E) |
| Linköping University, CMT | <ul style="list-style-type: none"> - Economic evaluation of technologies for health (E) - Market equilibrium (F) - Planning, budgeting & monitoring mechanisms (H) |
| Linköping University, Dept of Primary Care | <ul style="list-style-type: none"> - What is health? What is its value?(B) <p>(With special attention to health oriented altruism)</p> <ul style="list-style-type: none"> - Economic evaluation of technologies for health (E) |
| Stockholm School of Economics, Centre for Health Economics | <ul style="list-style-type: none"> - What is health? What is its value?(B) - Economic evaluation of technologies for health (E) - What influences health? (Other than health care) (A) - Demand for health care (C) - Evaluation at whole system level (G) |
| Karolinska Institute, MMC/LIME/ Dept of Social Medicine/ CFA/CFF/Dept of Medicine | <ul style="list-style-type: none"> - Economic evaluation of technologies for health (E) - What is health? What is its value?(B) - Planning, budgeting & monitoring mechanisms (H) - Evaluation at whole system level (G) - Supply for health care (D) |
| Karolinska Institute, Neurotec, Aging Research Center | <ul style="list-style-type: none"> - Economic evaluation of technologies for health (E) <p>(Applied on therapies in aging diseases)</p> |
| Umeå University, Dept of Economics | <ul style="list-style-type: none"> - What influences health? (Other than health care) (A) - Market equilibrium (F) - Economic evaluation of technologies for health (E) |
| Umeå University, Dept of Public Health and Clinical Medicine | <ul style="list-style-type: none"> - What influences health? (Other than health care) (A) - What is health? What is its value?(B) - Demand for health care (C) - Economic evaluation of technologies for health (E) - Evaluation at whole system level (G) |
| Uppsala University, Dept of Economics | <ul style="list-style-type: none"> - Demand for health care (C) - Economic evaluation of technologies for health (E) - What influences health? (Other than health care) (A) |
| Uppsala University, Dept of Pharmacy | <ul style="list-style-type: none"> - What is health? What is its value?(B) |

Table 4.7 -cont'd Major research areas at the research units

| Research unit/organization | Major research areas |
|--|---|
| Mälardalen College, School of Business | - Planning, budgeting & monitoring mechanisms (H) - Supply for health care (D) |
| Örebro University, Dept of Economics, Statistics and Informatics | - What is health? What is its value?(B) - Economic evaluation of technologies for health (E) |

The summary of research areas shows that the most common area is “Economic evaluation of technologies for Health” (E). Other common areas are; “What influences health? (Other than health care)”(A), “What is health? What is its value?”(B); ”Demand for health care”(C) and “Evaluation at whole system level”(G). More seldom is work done in the areas of “Supply for health care”(D), “Market equilibrium”(F) and “Planning, budgeting & market mechanisms”(H).

4.3 Authorities involved in health economics research

The four authorities in the survey give a mixed picture of their research efforts in health economics.

The Centre for Epidemiology at the National Board of Health and Welfare has one PhD student in health economics employed and the head of the centre, Måns Rosén, holds a position as Adjunct Professor at the Department of Public Health and Clinical Sciences in Umeå. Current research issues addressed at the Centre include prioritization of resources to primary prevention of cardiovascular diseases. On the question of key achievements the Centre’s response is; “We have, by combining methodology from health economics and from epidemiology, been able to show who to treat and not to treat. We have also shown inconsistencies in standard health economic methodology.”

At the *National Institute for Public Health* there are, according to the response in the survey, four employees involved in health economics research. Except for one of them who is a PhD student, most of the institute’s engagement in research is connected to commissioning and communicating results from research. When employees at the institute are engaged in research it is in collaboration with external research units. The institute also has long-term cooperation agreements with the universities of Lund and Umeå.

The *Swedish Council on Technology Assessment in Health Care (SBU)* has an internal working group for “Evidenced Based Economics”. The group consists of seven employees, four of whom have a PhD (one each in economics, business administration, epidemiology and cardiology). Even if the council does not perform any primary research in health economics, they use systematic reviews of health economic data complemented with own calculations regularly in their health technology assessment.

The *Pharmaceutical Benefits Board* is quite a new authority in Sweden (established in 2002). Health economic assessment of pharmaceuticals and different aspects of the market for pharmaceuticals constitute the main subjects in the Board’s regular official assignment. Five health economists are employed at the Board: two of them have a

PhD in economics. All of them have part of their working-time set aside for health economics research.

With regard to budget for health economics research the National Institute for Public Health had an internal budget of SEK 1.5 million and the external budget was SEK 2 million. The National Board of Health and Welfare had no internal budget but had an external budget of SEK 400.000. The Swedish Council on Technology Assessment in Health Care (SBU) had an internal budget of about SEK 70.000 and the Pharmaceutical Benefits Board answered that a certain amount of the time (5-20%) of the five employees involved in health economic research was set aside for their research.

5. Bibliometric survey of Swedish health economics research

Papers in international refereed journals and their citation impact can be used to evaluate the international standing of Swedish health economics. We will here focus on the Swedish output as a whole rather than comparing different Swedish research groups.

5.1 Papers in two top health economics journals

One way of assessing the quality aspect of research papers is to study to what extent Swedish papers appear in the top ranked journals. For this purpose, 1333 genuine articles published in *Journal of Health Economics*(JHE) and *Health Economics* (HE) were downloaded from *Web of Science*. In terms of journal citation impact, according to *Journal of Citation Reports* in 2004, JHE is ranked 7 (2.495) and HE ranked as number 17 (1.591) among 172 journals in Economics. Among 52 journals in Health Care Sciences & Services, JHE is ranked 6 and HE ranked 15. Thus, within economics as well as health sciences, these two journals could be considered to be among the most influential.

When counting papers by country, Table 5.1 shows that Sweden is on rank five during the publication years 1986-2004, as well as during the last five years, 2000-2004. Fractionalizing multi-country papers makes little difference. (Fractionalizing means that internationally co-authored papers are split between the countries. For example, if a paper is co-authored by two countries each country will be attributed half a paper.) Sweden has close to four percent of the world output in these two top journals which is quite a good indication of the strength of Swedish health economics. The number of Swedish papers in the whole database is about 2 percent. This means that health economics is a relatively strong field in the Swedish research profile, at least when it comes to publication activity. Another indication is that out of 1142 papers searched by “health economics”, Sweden has 64 papers, which is 5.5 percent of all. Similarly if we search for “health and cost benefit” Sweden has 4.0 percent and 3.5 when we search for “health and cost effectiveness”.

When counting the citations that these papers have received from the whole database Finland and Sweden scores high. This is impressive. However, one should note that

the top cited papers are often co-authored with several countries. Then, multiplying the citations with the paper fraction reduces the impact for all, especially for Finland, and then Sweden is at the very top. One highly cited papers with 106 citations is “*Income-related inequalities in health: Some international comparisons*” authored by 8 countries with Sweden and Finland included.

Table 5.1 Papers by country in JHE and HE

| Country | 1986-2004 | | 2000-2004 | | Mean citations per paper 1986-2004 | |
|--------------------------|-------------|------------------|-------------|------------------|------------------------------------|------------------|
| | Whole count | Fractional count | Whole count | Fractional count | Whole count | Fractional count |
| USA | 647 | 602 | 284 | 256 | 6.9 | 6.4 |
| UK | 319 | 270 | 169 | 134 | 5.9 | 4.7 |
| Canada | 93 | 71 | 54 | 36 | 5.6 | 3.9 |
| Netherlands | 93 | 71 | 48 | 33 | 6.2 | 3.9 |
| Sweden | 64 | 54 | 28 | 23 | 10.5 | 8.6 |
| Australia | 54 | 38 | 29 | 19 | 2.8 | 1.7 |
| Spain | 46 | 38 | 23 | 20 | 2.0 | 1.9 |
| Norway | 42 | 35 | 21 | 16 | 2.9 | 2.1 |
| Germany | 32 | 23 | 17 | 12 | 5.4 | 2.2 |
| Switzerland | 29 | 17 | 18 | 11 | 8.3 | 4.9 |
| Denmark | 22 | 18 | 15 | 13 | 5.1 | 2.5 |
| Belgium | 16 | 12 | 12 | 8 | 6.9 | 3.1 |
| Israel | 15 | 12 | 9 | 7 | 4.1 | 2.6 |
| France | 17 | 10 | 10 | 6 | 1.8 | 1.2 |
| Finland | 15 | 10 | 3 | 2 | 15.7 | 2.4 |
| Italy | 10 | 5 | 4 | 2 | 0.8 | 0.4 |
| All | 1586 | 1332 | 780 | 622 | | |
| <i>Sweden in percent</i> | <i>4.0</i> | <i>4.1</i> | <i>3.6</i> | <i>3.7</i> | | |

Another indication of the strong Swedish impact is that two Swedish authors, M Johannesson and UG Gerdtham, is among the authors that receives most citations to their papers from the whole database. Johannesson is also among the authors that are most frequently cited in the two journals.

Table 5.2 Most cited JHE & HE authors and first authors most cited by JHE & HE

| Rank | Citations to JHE & HE papers | | Citations made by JHE & HE | |
|------|------------------------------|-----------|----------------------------|-----------|
| | Cited author | Citations | Cited 1st author | Citations |
| 1 | Wagstaff A | 582 | Newhouse JP | 288 |
| 2 | Manning WG | 560 | Wagstaff A | 217 |
| 3 | Johannesson M | 450 | Grossman M | 209 |
| 4 | Gerdtham UG | 416 | Johannesson M | 208 |
| 5 | Mcguire TG | 356 | Manning WG | 203 |
| 6 | Grabowski HG | 350 | Dolan P | 199 |
| 7 | Gafni A | 334 | Nord E | 169 |
| 8 | Zwanziger J | 323 | Culyer AJ | 164 |
| 9 | Dimasi JA | 303 | Torrance GW | 158 |
| 10 | Hansen RW | 303 | Pauly MV | 154 |

5.2 Knowledge base of health economics

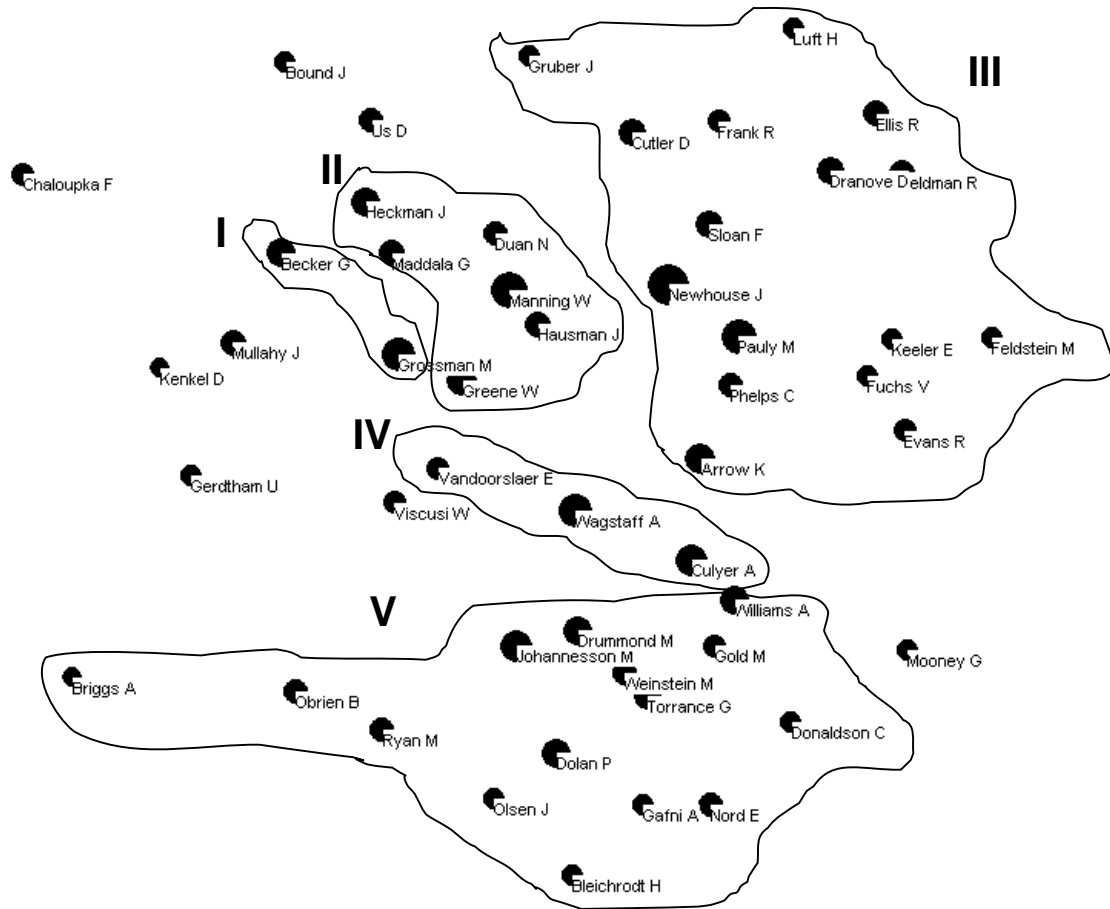
The map in Figure 5.1 shows how the most cited authors in the two journals are co-cited. We can assume that the structure of the map correspond to the intellectual structure of the field of health economics. If authors are co-cited in papers of a research field we can assume that they are similar in terms of the type of research they have published. A co-citation is mostly a citation relationship created by the citing behaviour of other authors than the co-cited ones.

The map was generated using a Multi-Dimensional Scaling algorithm applied to a matrix of co-citations. This means that the closer authors are located on the map, the more often they are co-cited. Circle size corresponds to the number of citations.

In the map we have tried to indicate some degree of structure by circling five groups, Roman numerals I-V. Co-cited authors in the relevant groups tend to use the same methods and theory and hence often work with the same substantive areas, e.g. economic evaluation, competition etc.

The first group, I, is largely concerned with the human capital approach to health economics. Michael Grossman is a leading health economist – father of the ‘Grossmann model’ mentioned in Section 6 below. Nobel prize winner Gary Becker is the intellectual father of some the basic work, but not an health economist. Group II is with one exception (Willard Manning) statisticians/econometricians. They undoubtedly would not consider themselves to be health economists, but rather methodologists who have published in the health field. Group III is made up of US health economists and one Canadian (Robert Evans). They have largely published on US-related issues. Group IV consists of three (European) researchers who have made important contributions to equity issues. Group V is largely European and Canadian. These researchers have worked largely with economic evaluation and the valuation of health. A Swedish researcher (Magnus Johannesson) can be found in this group.

Figure 5.1 Map of most cited and co-cited authors cited by JHE & HE



Now, if we consider the citations made in Swedish papers, Figure 5.2 suggests that Swedish research is oriented towards the lower part of the map, where we also find the Swedish author Magnus Johannesson as one of the key figures.

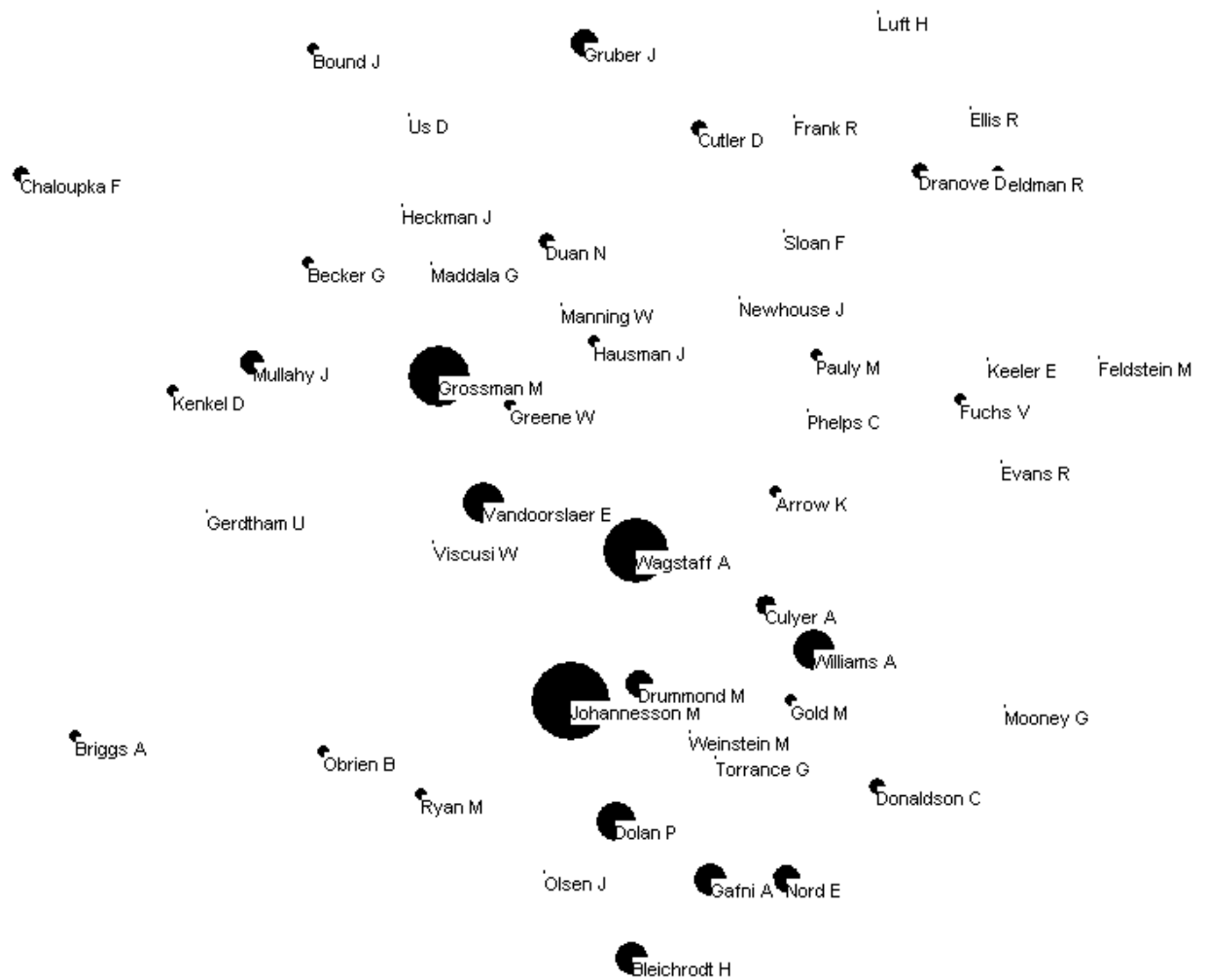


Figure 5.2. Same map as figure 5.1 but now circle size corresponds to citations from Swedish papers

5.3 Self-reported papers of the evaluated groups

Each group was asked to list the publications from the research unit/group in the area of *health economics* during the past five years, i.e., from 2000 on. The list was to be separated into a) publications in refereed journals (include submitted manuscripts) and b) other publications. Table 5.3 shows the number of publications in English. There are quite big differences in number of papers in refereed journals, which reflects the level of activity at the different locations, but probably also differences in publication strategies.

Table 5.3 Self-reported publications in English by research group 2000-2005

| Group | Publications in refereed journal | Other publications |
|--|-------------------------------------|-----------------------|
| Stockholm School of Economics: Centre for Health Economics | 111 | 21 |
| Lund Univ: LUCHE (Lund Univ Centre for Health Economics) | 103 | 44 |
| Karolinska Institute: Dept of Publ Hlth Sciences, Dept of LIME, Dept of Medicine, Sthlm Centre f Publ Hlth, Centre for Allergy Research, Inst. of Environm. Medicine, Dept of Medicine | 79 | 34 |
| Lund Univ: Sect f psychiat, primary care and public health, Malmö | 61 | 27 |
| Swedish Institute for Health Economics (IHE), Lund | 50 | 12 |
| Linköping University: Ctre f Medical Technology Assessm. (CMT) | 38 | 8 |
| Umeå University: Dept of Public Health and Clinical Medicine | 32 | 0 |
| Karolinska Institute: Section f health economics, ARC, Neurotec | 23 | 38 |
| Göteborg University: Department of Economics | 22 | 9 |
| Umeå University: Department of Economics | 15 | 10 |
| Uppsala University: Department of Economics | 2 | 0 |
| Total | 536 | 203 |

If we search Web of Science for papers that have “Hlth Econ OR LUCHE” and “Sweden” in the same address, we find just about the same number of papers in refereed journals for Centre of Health Economics at Stockholm School of Economics (123) and IHE in Lund (50), and for LUCHE (95). Looking at the mean number of citations for papers from 2000-2005 there are quite small differences between the three groups, they all have 3.9 citations per paper.

5.4 Citation impact of papers

A broader picture is presented in Table 5.4 where papers from health economic groups are compared by country. Although this is a very arbitrary definition of health economics, Sweden is on 5th rank in terms of papers produced and the citation impact is also at the same level as the other top producing countries. The growth of papers is well in line with the international development (Table 5.5).

The degree of international collaboration can be found by dividing the sum of whole count papers with the sum of paper fractions. The higher the index value the more international collaboration. It is quite natural that large producers have a lower degree of collaboration, since a larger portion of actors is to be found within the country. Still, Sweden has a somewhat higher degree of international collaboration than the four larger producers and also higher than Australia which produces less papers.

Table 5.4 Papers from health economic research centres 2000-2005 and their citation impact (Note: Papers in WoS searched by “Hlth econ” in the address field)

| Rank | Country | Papers | Citations/paper | International collaboration |
|------|-------------|--------|-----------------|----------------------------------|
| | | | | (Whole papers/fractional papers) |
| 1 | UK | 1112 | 5.4 | 1.29 |
| 2 | USA | 968 | 4.7 | 1.28 |
| 3 | Canada | 411 | 5.0 | 1.37 |
| 4 | Germany | 314 | 2.8 | 1.38 |
| 5 | Sweden | 250 | 4.2 | 1.50 |
| 6 | Australia | 161 | 3.3 | 1.39 |
| 7 | France | 156 | 3.1 | 1.70 |
| 8 | Belgium | 129 | 2.1 | 1.78 |
| 9 | Norway | 76 | 2.3 | 1.56 |
| 10 | Netherlands | 74 | 4.5 | 2.53 |

Table 5.5 Papers from Health Economic centres by publication year 2000-2005
(Note: Papers in WoS searched by “Hlth econ” in the address field)

| Country | Year | | | | | | Total |
|-------------|------|------|------|------|------|------|-------|
| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | |
| UK | 129 | 151 | 186 | 206 | 222 | 217 | 1111 |
| USA | 72 | 112 | 145 | 206 | 210 | 221 | 966 |
| Canada | 28 | 53 | 72 | 79 | 101 | 78 | 411 |
| Germany | 10 | 18 | 49 | 58 | 76 | 103 | 314 |
| Sweden | 23 | 31 | 34 | 47 | 49 | 66 | 250 |
| Australia | 28 | 15 | 23 | 23 | 36 | 36 | 161 |
| France | 7 | 9 | 16 | 39 | 39 | 46 | 156 |
| Belgium | 3 | 5 | 13 | 49 | 27 | 32 | 129 |
| Norway | 4 | 4 | 8 | 15 | 15 | 30 | 76 |
| Netherlands | 5 | 9 | 10 | 21 | 12 | 17 | 74 |

In Table 5.6 the most frequent subfields are listed. The percentage of papers in these categories is quite similar between Sweden and for all papers. About 60 percent of the papers are included by these top categories and there are small differences within each subfield.

Table 5.6 Percent of papers by subfield for Sweden and the world (Note: Papers in WoS searched by “Hlth econ” in the address field. Subfield refers to journal subject category)

| Subfield | All papers | Swedish papers |
|---|------------|----------------|
| Health Care Sciences & Services | 10.8 | 10.5 |
| Medicine, General & Internal | 10.8 | 5.9 |
| Public, Environmental & Occupational Health | 10.5 | 8.4 |
| Pharmacology & Pharmacy | 7.4 | 10.0 |
| Health Policy & Services | 7.4 | 9.0 |
| Endocrinology & Metabolism | 6.3 | 8.7 |
| Economics | 3.7 | 5.3 |
| Rheumatology | 3.6 | 3.6 |
| Sub total | 60.4 | 61.4 |
| Other subfields | 39.6 | 38.6 |

5.5 Conclusions

Using several bibliometric data sets we get quite similar results regarding the international standing of Swedish health economics. Although being a small country, Sweden is on rank 5 when it comes to paper output. The citation impact of the Swedish papers is also at a high level and somewhat higher compared to the paper output. According to data presented by In-Cites at Thomson ISI, this is significantly better compared to the Swedish output in all fields of science where Sweden is on rank 14 for papers and rank 11 when it comes to citations (<http://www.in-cites.com/countries/sweden.html>).

The level of international collaboration is high and the research profile of Sweden resembles the international profile quite well. All these observations refer to the time period 2000-2005 and it appears that Sweden has established itself as a strong contributor to international research in health economics.

6. Evaluation of research quality and policy relevance

6.1 Criteria for assessing research quality and policy relevance

In assessing the contribution of Swedish health economics research, both research quality and policy relevance were considered to be important. Therefore each research group was asked to supply copies of up to five papers that they considered to rank highly under one or other of the two criteria. A list of the publications submitted by the research units can be found in Appendix D.

The criteria for assessing research quality are easier to define, since the quality of individual papers is highly correlated with the quality of the journals they are published in. Therefore, in the bibliometric survey we assessed the contribution of Swedish health economics research based on publications in the top two journals in the field, the *Journal of Health Economics* and *Health Economics*.

Nevertheless, this is a slightly imperfect approach since some of the best applied papers in fields such as economic evaluation may be published in high impact medical journals. (For example, one of the papers containing an economic evaluation based on the Scandinavian Simvastatin Survival Study (4S) was published in the *New England Journal of Medicine*, the highest impact medical journal.) It is also possible that a high quality methodological or theoretical contribution in health economics could be published in top general economics journals, but the chances of this are much lower. Furthermore, there is a tendency in evaluations like the present one to focus on publications in English, thereby neglecting research published in Swedish. This may be particularly true in the case of policy-oriented research.

The articles submitted by the research units have been classified according to the areas of health economics research outlined in Figure 3.1. The idea behind this systematic presentation is not to evaluate the submitted papers in detail, but to present

a picture of research carried out in order to convey an idea of the coverage and quality of Swedish health economics research.

The criteria for assessing policy relevance are much harder to specify and measure. In rare cases a piece of research may be used directly in policy formation. More realistically, the output of research may contribute to the policy debate in more general terms. Therefore it was not possible to seek independent data on the policy relevance of research, so the evaluation team relied mainly on the comments provided by the research groups themselves, supplemented by comments from the decision-makers that were interviewed.

Overall, however, the immediate policy relevance of the research is not high, either because policy relevance has not appealed to, or been a success criterion, for the researchers, or because the authorities have not commissioned much of this type of research. Economic evaluation is the exception to the rule. The policy relevance is clear and much research has been commissioned, by, for instance, pharmaceutical companies.

However, overall the theoretical and empirical level of Swedish health economics research is high, and in some areas it is leading the field.

6.2 Evaluation topics

6.2.1 What influences health (other than health care)? - Box A

High quality theoretical and empirical research has been carried out in this area. While of high standard academically, this research is of limited policy relevance. This is not a criticism, but an observation that stresses the fact that not all research needs to have policy relevance as the dominant criterion.

The classical Grossmann model for demand for, and investment in, health has been extended in several important respects by the LUCHE group in Lund, e.g., to the family and the labour market.

The relationship between income and health has been investigated empirically by making good use of the unique opportunities provided by the availability of panel data covering a long time span. The Umeå University health economics researchers have explored ethical attitudes regarding health, wealth and gender and provided a somewhat new perspective on health.

A joint Lund-Stockholm paper has partly revived the empirical tradition for exploring the relationship between macroeconomic cycles. While earlier research in this tradition focused on the effect on mortality, this work focuses on social security spending due to sickness and disability.

6.2.2 What is health? What is its value? - Box B

Theoretical work on the quality-adjusted life-year (QALY) has been undertaken both in Umeå and Linköping. In Stockholm and Göteborg both empirical and theoretical work has been conducted in the field of contingent valuation and the estimation of the

willingness-to-pay for health and health care. In general, this research is of high quality and at the leading edge of research on these topics being undertaken in Europe.

6.2.3 Demand and supply of health care – Box C and D

Except for research on pharmaceuticals (see 6.2.5), the studies regarding demand and supply of health care have been minimal. The demand for health care has been to some extent considered by Umeå University in their research project in Vietnam. Within a utilization framework, informal and formal care for the elderly has been studied in Stockholm.

6.2.4 Microevaluation at the treatment level- Box E

Microevaluation at the treatment level (usually known as economic evaluation) is by far the most prominent area of health economics research in Sweden. A wide range of empirical studies has been undertaken at several centres, including the Institute for Health Economics in Lund, the Centre for Medical Technology Assessment in Linköping, the Karolinska Institute and the Stockholm School of Economics. The empirical work is, in general, well-conducted and is mostly published in the English language in international journals.

Because of its applied nature, economic evaluation lends itself to applications in health care decision-making. Therefore, it is of no surprise that several of the examples of policy relevant research identified by the research groups were in this field. These included work on pharmaceuticals and on the determination of medical treatment guidelines.

In addition, there has been work on developing the methods of economic evaluation, both at Linköping, the Stockholm School of Economics and Umeå. The methodological research in Stockholm is particularly noteworthy, since it is at the leading edge and is widely respected at the international level.

6.2.5 Market equilibrium – Box F

Theoretical work in this area is scarce, if defined to include equilibrium or disequilibrium price or quality levels, or non-price rationing. There are some studies looking at either the demand or the supply side, but almost always independently.

Markets for pharmaceuticals have been explored, however. Studies include pricing of new drugs, effects of changes in Swedish pharmaceutical markets, including evaluation of the drug benefits system and incentives among manufacturers, payers (fixed budget), formulary committees, prescribing physicians, pharmacies and patents. Studies have been made in many institutions (Stockholm School of Economics, IHE and Umeå University). The quality and policy relevance of these studies are generally good.

6.2.6 Evaluation at the whole system level- Box G

Swedish research in this area has been concerned with equity, international comparisons of health expenditure and health care systems. Since the late 1990s research on efficiency and performance of the health care system, including regional differences in productivity, cost, outcome, availability and use of services has been

minimal. At the Karolinska Institute, Umeå University and IHE, some research has been undertaken regarding financing and organization of health systems in low and middle income countries, however.

In general, the quality and amount of research in equity has been substantial. In the 1990s and early 2000s Swedish researchers at the universities of Lund and Stockholm were involved in the ECUITY-group, which concerned with income-related equity in financing, delivery and health. The Stockholm School of Economics also developed the methodology used in the research. Later – in the 2000s - research has focused on inequity in health. In Stockholm the research has extended to evaluate socioeconomic inequalities in life-expectancy and more importantly in QALYs. This research has been published in the two top journals in field and is also very policy relevant.

In the 1990s the Stockholm School of Economics was one of main moderators and pioneers in comparing and explaining differences in international health expenditure. Also, in the 2000s, some articles have been published in top journals.

In addition, IHE has performed some international comparisons of health care systems and been involved in a European comparison of health care reforms. The universities of Göteborg, Lund , Stockholm and Uppsala have been members of SHARE (the Survey on Health, Aging and Retirement in Europe). All these can be seen to have policy relevance, although their results have not so far been published in top journals.

6.2.7 Planning, budgeting, regulation and monitoring mechanisms – Box H

Although worldwide this topic has been primarily American in its content, some work has been recently undertaken at the Umeå and Malmö/Lund universities. Both theoretical and empirical studies have been undertaken, including analyses on how public policies should be planned relating to consumption of unhealthy food, the impact of aging on hospital and local taxes, analysis of life saving regulation and their income effects and optimising the financing of sickness absence and health care. A few of these studies have so far been published in general economic journals. Much of the work is still academic with no direct contribution to policy. An exception is a budget allocation model of specific preventive actions (Umeå University).

At Mälardalen University unpublished work has been carried out trying to combine insights from an accounting, human resources and management perspective. However, at present it is not possible to pass definitive judgment of this approach. It probably needs more maturation.

6.2.8 Other topics

Some researchers spread their wings across more than one topic. These include methodological research on experimental economics and health (Stockholm School of Economics) and well as developing methods for eliminating selection bias in non-randomised data (Stockholm School of Economics). The experimental approach to economics is promising and a possible very fruitful research avenue. It also seems to be a promising approach to use econometric methods originally developed for the evaluation of labour market and social interventions for the analysis of data from health care interventions.

7. Evaluation of structural elements

7.1 Institutional structure

An overriding question in health economic research is where an academic milieu should belong as the theoretical base is economics, yet the empirical subject of interest is health and health care services. Traditionally these two fields are organized in different faculties and departments, to some extent also in different institutions (university and business school). In a medical faculty the research may be hampered by lack of theoretical frame and models whereas the strength is proximity to the studied field and access to data which facilitate empirical research. On the other hand, research in economic departments and in business school may miss insight into health and health services whereas economic theory and theoretical research will be well taken care of. Health economic research in Sweden is performed both in faculties of medicine and of social sciences at universities, as well as in business schools. However, health economic research, especially applied health economics, is interdisciplinary and will obviously benefit from and even to some extent depend upon collaboration between medical/health scientists and economists. A close and trustful collaboration is needed.

Health economics in Sweden is spread across several universities, business schools and university colleges all over the country. Two milieus are more outstanding and bigger than the others, namely that in Stockholm and that in Lund/Malmö, whereas others are smaller and more vulnerable. Within the universities the economic departments and often several different departments/sections at the medical faculty are involved, depending upon the organization of the medical faculty. In a few places the research is restricted to the social science faculty without close collaboration with medicine. But at most universities there is good cooperation across institutional borders like in Lund/Malmö, and between business school and the university, as in Stockholm.

The institutional structure and formalities for collaboration varies considerably between the universities. Close collaboration seems to either depend upon personal contacts between dedicated researchers across borders and/or upon an operating formal structure. Lund/Malmö has formalized a network through LUCHE in order to facilitate the collaboration in health economics research. LUCHE, as a centre without walls, is a multidisciplinary umbrella across many departments and across the physical localization of the research units in the area. LUCHE is organized as part of the medical faculty, but many researchers have their position other places, including in the Vårdal Institute. The model of forming a centre without walls seems to be a good idea for organizing research that crosses borders. Whether it should be administered through a faculty of medicine or a faculty of social sciences may depend upon the situation. Both possibilities have their strength. "Belonging" to a medical faculty makes access to data easier, whereas "belonging" to an economic department ensures a link to the mother discipline. Anyhow, any formal structure must take both these aspects into account.

Health economics as applied research and the diffusion of results from the research to decision makers requires contact with health authorities, both for formulating relevant

applied research questions, for passing on knowledge to them and for research funding. Use of researchers employed in academic institutions by health authority bodies in Sweden is limited. However, some health economists (PhD students or persons with a PhD) are employed in some authorities. At the national level close contact between health economics researchers and health authorities is scarce, with some exceptions like the Pharmaceutical Benefits Board. At the county level the contact is somewhat better, but a county council does not often ask for or initiate research. As health care in Sweden is decentralized to the county level, the lack of contact at the national level (with few exceptions) seems to contribute to a limited interest in more overriding health economics questions. Thus, there is a need for a national plan for health economics research, especially for studies that cross administrative borders and for studies of health reforms, studies that use national register data etc. This is even more urgent as health service research seems to have faded away in Sweden during the last years.

Most of the universities had found some sort of collaborating arrangement which to some extent worked, but only one had a formal interfaculty and interinstitutional organization that seemed to work well without formal borders, as mentioned before. Many of the representatives from the universities expressed plans for establishing future collaborating bodies as they were well aware of the problems involved in fostering research and training in health economics across traditional faculty borders.

7.2 Research capacity and training

In total, there are quite a number of researchers within health economics. However, many of them are working part time in health economics research. A substantial number of PhD students (46) have defended their dissertation in health economics during the last few years, around 20 percent of them being women. About half of the candidates are at present working in a university or business school. However, very few of these are women. One reason for this may be that a health economics researcher has to rely on payment for smaller projects, which gives an insecure job situation. Young women, who need to plan their reproductive career, may be less likely to go into such an insecure situation. This may create a problem as it is required that a woman is represented in any adjudication committee. As so few women go into university positions, this puts a heavy burden upon those few women working there. Many health economists are working in the industry and as consultants, and the job possibilities are overall good for health economists outside the universities, whereas the possibility for getting a senior position within the university is seriously limited.

A substantial number of health economics courses are given at all universities, both at economic departments and at medical/public health departments. The number seems to have grown rapidly over the last few years. There is still only one master programme in health economics, started in 2003, but at least one other university expressed plans to launch such a master programme in the near future. It is at present possible to include courses in health economics in other master programmes, like those in public health. Many of the courses focus on economic evaluation, fewer on theory of health economics. There seems to be a need for more in-depth master programmes and courses in health economics and the plans for developing more programmes are encouraging.

There are many PhD students in health economics within Sweden. The students may have their basic training in economics or they come from medicine, statistics, public health or other health sciences. A challenge for the universities is to provide all of these with a good and relevant PhD programme in health economics, meaning that those with an economic training will get some insight in health and the health care sector, whereas those with a non-economic background will get a possibility to develop enough insight into economics to deserve to use the title 'health economist'.

The PhD students and their doctorate programmes had different points of departure. At faculties of social sciences the PhD programme for health economics is included in the ordinary PhD programme in economics. The subject for the thesis constitutes the main reason to name the thesis a PhD in health economics. The possibilities to include specific health economics courses in those PhD programmes are limited or non-existent. Often, however, the students have supervision from researchers in both medicine/health sciences and economics. Students with their masters in economics choose this PhD approach and those students usually have no affiliation to a medical institution, except for the supervision. This means that they do not get a broad insight into the health sector. For their future research and job possibilities, courses which provide them with a broader insight into the health services could be recommended.

For PhD students with a non-economic background the situation may be described as the opposite and as muddling through. Their possibilities to take courses in economics are limited as few courses are designed as to match their needs. A non-economics PhD student in health economics usually takes some courses in economics, especially within economic evaluation. However, the possibility to get deeper insight into economics is limited as they are not qualified to take more advanced courses in economics.

The situation for PhD students with both an economic and a non-economic background is thus not satisfactory and it is easy to fall between the chairs. There is a need to develop more target designed doctorate programme in health economics with courses for both groups of students. Such a programme could be a national task which would also ensure better contacts across universities/business schools and among PhD students with various backgrounds. Obviously a programme should include a number of elective courses in order to fit candidates with different background.

7.3 Financing health economics research

Financing health economics research raises a problem and many good researchers have given up, creating a leakage from the universities. As an interdisciplinary activity, which in addition is scattered in many universities and departments with limited contacts with each other, it has not been possible to win the competition of becoming a "Centre of excellence". The small number of outstanding researchers also limits the possibilities to get "excellence" money, partly because they are too busy to keep their research institutions going. Further, within medicine, health economics will have to compete with clinical and basic medical research, a competition which an interdisciplinary research project will loose easily. Ear-marked money might be needed to help this situation.

FAS rate of approval for all applications has declined from 17 percent in 2001 to 13 percent in 2005. The last two years have seen a substantial increase in health economic applications, but there has been no corresponding increase in the number of funded such applications.

For PhD students it has until recently been possible to start the doctoral programme without guaranteed financing for the total period. This has made it possible to use various sources to pay their salary, in turn making it possible to contract many students. The situation has now changed as financing for the entire programme period has to be guaranteed for a student to be accepted into a PhD programme. As it is difficult to obtain such longer financing, there is a fear that the number of PhD students will decrease in the near future. This makes it most urgent to develop new possibilities for financing, either through the universities themselves or through research foundations and councils like FAS, county councils, the industry, state health authorities etc. However, tight budgets in local government reduce their ability to commission research.

At the universities and business schools another difficulty is evident. The number of professors in health economics is small and increasingly the professors have to take care of their own salary partly through external sources, and thus compete with money for doctoral students. This lack of senior positions in health economics is a challenge which makes the situation vulnerable. The economy of the universities makes it increasingly difficult to increase the number of senior positions who could constitute a solid base for future health economics.

Some areas within health economics may be easier to finance than others like studies on ageing, labour market or sick leave. The topics which seem to be most difficult to finance today are studies of health reforms and health policy studies.

7.4. National and international cooperation

Training and research in health economics typically crosses borders. At the local level this is secured in different ways and to various degrees through collaboration (see 6.1). Nationally, however, there seems to be no formal collaboration between the departments, and even between individual researchers from different universities, research collaboration is limited. Students may to some extent take part of courses offered at other universities, but there is no common programme for master or PhD students across Sweden, as said in 7.2. Such a programme, where students across Sweden would meet, could facilitate more cross-national collaboration and get the students exposed to a broad spectrum of health economics.

Although Swedish health economists meet each other at international conferences, such as the annual Nordic health economists' meeting, there are few opportunities within Sweden where all health economists can meet in order to exchange and challenge their ideas and results. Neither are there many opportunities for health economists to meet with central or local health authorities in order to pass on research results in an understandable fashion or to discuss research questions that might be of importance for health policy decisions. The IHE-FORUM conferences, which are held annually for the purpose of exchange between health economists and senior decision-makers from the health care and pharmaceutical market, constitute a commendable

initiative. However, there appears to exist a communication gap between Swedish health economists and health authorities (at national and local level) and closer contacts and collaboration between researchers and health authorities need to be developed. Improved contact between researchers and health authorities would also increase the probability of authorities commissioning studies to the research community and thus raise more money for health economics research.

As mentioned above, at the Nordic level and internationally there are formal forums for meetings among researchers. Health economic researchers in Sweden take part in conferences in such forums, and from the publications it is evident that the researchers often do collaborate internationally. However, Swedish health economics researchers may also benefit from holding national conferences for professional discussions amongst themselves.

7.5 Leadership and management

The nature of health economics makes good leadership most crucial. It is evident that at the universities and business schools in Sweden, where health economics has blossomed, outstanding leaders and dedicated researchers have been decisive. It is a big challenge to replace those leaders as they are getting older. As said in section 7.2 the possibility to get a new permanent professorship is small. It is most urgent that someone takes on the responsibility to identify new young leaders in health economics and give them an opportunity to build health economics for the future.

8. Overall evaluation and recommendations

Our overall impression of Swedish health economics research is very positive. In making the assessments and conclusions below we have, of course, been influenced by how the sub-discipline has developed in our own countries. Many features are similar, such as the mixture of theoretical and empirical research in major fields such as economic evaluation. It is clear that Sweden is one of the world leaders in this topic. Perhaps the most striking difference between Sweden and our own countries is the relative lack of research into the 'big-picture' issues facing all health care systems, such as how to allocate resources equitably, how to measure the efficiency of the system and how to increase incentives. In our countries the ministry, or those responsible for providing health care (e.g., county councils), commissions research into these topics from academic institutions, but this appears not to be the case in Sweden. We return to this point below.

8.1 Conclusions

1. The academic standing of Swedish health economics research is very high. In publications in the highest quality journals, Sweden ranks 5th in the World, which is higher than one could reasonably expect, given the relatively small number of researchers in the country.
2. Because the overall number of health economics researchers in Sweden is small, this exceptional performance is based largely on the output of a very few key individuals. If these individuals were to leave the field for any reason, Sweden's

position will possibly decline. However, the relatively high number of PhDs produced in Sweden over the last five years does offer potential for the future.

3. Overall research output is excellent, especially in the field of economic evaluation. However, several important areas of health economics research are not very prevalent in Sweden, at least over the last 5 years. These include analysis of the financing and supply of health services, the assessment of the productivity of health care institutions and the evaluation of the health care system at the macro level.

The reasons for this are many and varied. For example, Swedish researchers may not be interested in these topics. On the other hand, decision-makers may prefer to undertake these analyses internally, rather than commission them externally. The relative importance of the various factors is unclear. However, during our review we did not find any examples of requests for this type of research by decision-makers that had been ignored by researchers.

4. More generally, the policy impact of Swedish health economics research does not match its scientific quality. Compared to other countries in Northern Europe, we did not find the same level of engagement between researchers and decision-makers, except in specific cases, such as the Pharmaceutical Benefits Board (LFN). Here, cost-effectiveness is a clear criterion for decisions and there is substantial input by health economists to the process.

However, in general there is relatively little policy research by Swedish health economists. In contrast, in other countries there is a tradition of independent policy research, conducted by university-based groups.

5. Both researchers and decision-makers felt that there was a scarcity of trained health economist researchers. The reasons for this are probably multi-faceted. We noted that there was only one masters programme in Sweden, which itself was established only in 2003. (By comparison the first masters programme in the UK was established in 1977.) There are several PhD programmes, based in economics or health sciences departments, allowing a specialism in health economics, but the output of these is variable, owing to limited funding. In addition, in PhDs based in health sciences departments, the formal training in health economics and econometrics is somewhat limited, so the graduates of these programmes may not be able to undertake some kinds of health economics research.
6. Another reason for the lack of trained researchers in the public sector is the lack of career progression. Those with PhDs find it difficult to obtain post-doctoral positions and junior faculty posts. By contrast, a major beneficiary of the PhD programmes has been the pharmaceutical industry, which has employed a substantial number of the graduates.
7. Some health economics teaching and research activities are located in economics departments, others in health sciences centres. Each location for health economics has its advantages and disadvantages. In an economics department, health economics is close to its 'mother discipline' and there is greater oppor-

tunity for theoretical work. In a health sciences centre, multidisciplinary work is encouraged and the acceptance of health economics among the clinical disciplines is increased. The health economist is also closer to the ‘sharp end’ of health care delivery. A balanced national programme in health economics would ideally embrace both types of institutional arrangements. An even better situation would be the development of organizational structures that enable health economists to have links with both economics and health sciences.

8. In general, Swedish health economics researchers have been fairly successful in attracting funds to support their activities. However, the vast majority of funding relates to projects and/or other short-term activities, rather than being secure long-term funding. This imparts a certain fragility to the whole teaching and research activities in health economics in Sweden.
9. Health economics research makes considerable use of register data. We noted several such examples in Sweden but, given the existence of good register data, we felt that this was an area to be exploited further.
10. Some health economics groups, such as LUCHE in Lund and Stockholm School/Karolinska Institute in Stockholm, have developed collaborative networks. This is to be encouraged, especially in the case of the small health economics groups.

International collaboration is also important, given the similarities in health care resource allocation issues worldwide, and the potential for learning new methodological approaches. There were several examples of fruitful international collaboration among the Swedish centres.

8.2 Recommendations

1. Training and career progression

Encouragement should be given for the expansion of masters programmes in health economics. However, those institutions developing programmes should be encouraged to collaborate with one another, in the interests of delivering high quality courses.

More funding should be given for post-doctoral research in health economics. Consideration should also be given to establishing a PhD Research School, so as to enable more students to gain access to the highest level tuition.

2. The infrastructure of innovation

Efforts should be made to establish at least one major research centre in health economics, with links both to a high quality department of economics and a health sciences centre. Initially, programme funding should be made available for one or more centres to build up expertise to enable them to compete in the ‘Centres of Excellence’ competitions organized, from time-to-time, by the research councils.

3. *Funding*

Efforts should be made to secure more long-term funding for health economics. This could be achieved by universities creating more tenured positions, or by the research councils or government agencies offering programme funding, as mentioned above.

4. *Quasi-experimental research*

Health economics researchers should be encouraged to make more use of the high-quality data registers available in Sweden. They should also be encouraged to develop new methods for the analysis of register data and to improve on the content of registers. There will be a national call for proposals soon and the potential for submissions from health economics researchers is high.

5. *A health economics research agenda responsive to policy*

The connections between health economics researchers and decision-makers, at both local and national levels, should be strengthened. The mechanisms for achieving this could include:

- holding more annual national health economics conferences, bringing together researchers and policy makers at national and local levels;
- specifically funding research in areas where Swedish researchers have not been very active to date.

6. *Industry contribution*

Given the benefits it receives from the availability of trained health economists in Sweden, the Swedish-based health industry (i.e. pharmaceutical companies) should be encouraged to make a financial contribution to the training of health economists (e.g., through PhD fellowships and post-doctoral fellowships).

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Appendix A – inventory and follow-up surveys



FORSKNINGSRÅDET FÖR ARBETSLIV
OCH SOCIALVETENSKAP
SWEDISH COUNCIL FOR WORKING LIFE AND SOCIAL RESEARCH

May 10, 2005

Evaluation of health economics research in Sweden

Dear Professor

The government of Sweden has commissioned the Swedish Council for Working Life and Social Research (FAS) to carry out an analysis of Swedish health economics research. The commission should include an inventory and evaluation of research carried out in the area. The evaluation should pertain to the scientific quality as well as the social relevance of the research and should be reported to the government by the end of February 2006.

As part of the *inventory* we are now sending out a questionnaire (or self-evaluation) to research units and groups identified as active in the area of health economics research. You will find a mailing list for the questionnaire attached to this mail. We would be grateful if you would let us know if you find that important Swedish health economics research units or environments are missing in this list (via e-mail, see below).

A small Swedish reference group has been appointed for consultation on various aspects of the inventory and evaluation. It consists of Professor Björn Smedby, University of Uppsala and Professor Stig Wall, University of Umeå. A group of international experts in health economics has also been set up to carry out the *evaluation*. The group consists of Professor Grete Botten, University of Oslo, Norway; Professor Michael Drummond, University of York, UK; Professor Unto Häkkinen, STAKES, Finland and Professor Kjeld Møller Pedersen, University of Southern Denmark. Definite plans for the evaluation have not been made yet, but these may include interviews with researchers, submission of publications and bibliometric analyses.

We would like to ask you, as head of a research unit in the area of health economics, to answer the questions in the attached self-evaluation form and return it to us. If you are not active *yourself* in the area we would like to ask you to forward this mail to a representative of the research area in your department. We are grateful for your co-operation in this matter since it is of great importance for the successful completion and appropriate conclusions from the evaluation that we get as broad input as possible from health economics research units in Sweden. The completed form should be returned to kerstin.carsjo@fas.forskning.se no later than **May 31, 2005**.

If your department/unit is *not active at all* in the area of health economics, we would be grateful if you let us know this via an e-mail to Kerstin Carsjö. If you have any questions please contact Kerstin Carsjö at the above e-mail address or at 08-775 40 89.

Best regards,

Rune Åberg,
Secretary General, FAS



Evaluation of health economics research in Sweden - Instructions for self-evaluation by research units/groups

1. Name, position, phone number and e-mail address of respondent:

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2. Name and address of department/unit/group:

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3. Please list the members of your research unit/group who are active in the area of *health economics* research. List the name, position/title, discipline (e.g., medicine, economics etc), year of PhD, % time in *health economics* research during 2004. Include doctoral students and list the major discipline of their basic education.

| |
|--|
| Name, position/title, discipline, year PhD, % time |
|--|

4. Describe briefly the current *health economics* research programme of your unit/group. If a research programme has not been developed, please describe which are the main research areas of interest in your group (if not member of group describe own research interest).

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5. Please indicate your unit's budget for *health economics* research during 2004 (including salaries and social fees). Separate the budget into a) internal (i.e., faculty and ALF funds) and b) external grants (after deduction for university costs.)

- | |
|---|
| a) internal budget for health economics research: |
| b) external budget for health economics research: |

6. Please describe research training courses in *health economics* (including masters level) offered by your unit since 2000. List name of course, credits worth (poäng), average number of participants and most common educational backgrounds of participants.

7. Describe one or more key achievements from your research unit/group from about 2000 on (major contributions to international front-line *health economics* research – include both methodological research, theoretical contributions and empirical research).

8. Describe major applied contributions from your research unit/group to *health policy* development in Sweden and internationally (societal impact of your research) from 2000 on (e.g., participation in health policy processes including committees, consultations with local or central government).

9. Describe your unit/group's research collaboration (documented by co-publishing or otherwise) in the area of *health economics* at the national and international level from 2000 on.

10. Describe what areas of *health economics* research you plan to continue and develop in your unit/group during the next few years.

11. If you have any additional comments you would like to make, please do so below (maximum half a page).

Thank you for your co-operation! Please note that the total number of pages of your response excluding the appendix (see below) should *not exceed 10 pages*. Unless you indicate otherwise, your response will be stored in a computerised register.

Appendix A. List of publications

Please list the publications from your research unit/group in the area of *health economics* during the past five years, i.e, from 2000 on. Separate the list into a) publications in refereed journals (include submitted manuscripts) and b) other publications

a) Publications in refereed journals

b) Other publications

September 7, 2005

Evaluation of health economics research in Sweden – Follow-up questions

Dear

Thank you for replying to the self evaluation questionnaire we sent out in the spring as part of our commission to evaluate health economics research in Sweden.

We have now collated the results of this survey and have discussed these at a meeting in August with the appointed international evaluation group and the Swedish reference group. Plans for the evaluation have been drawn up and these include bibliometric analyses, interviews with researchers and decision-makers/administrators as well as the collection of some additional information from the research groups.

The international evaluators felt that they would like some more information from the researchers in three areas: inflow and outflow of PhD's, sources of external funding as well as a new list of publications indicating the most important ones from a point of a) scientific quality and b) policy relevance. We would also like to ask you to send in copies of the five best and most representative publications. We should stress that it is not the intent of the evaluators to make a ranking of individual research units based on the list of publications, but rather to use them as a basis for a benchmarking of Swedish health economics research (as a whole) against health economics research on the international level.

We would therefore like to ask you to answer the three additional questions in the attached questionnaire and return it to us. For your convenience we have attached your previous response to this mail for easy reference. The completed questionnaire and publication lists should be returned to kerstin.carsjo@fas.forskning.se no later than **September 30, 2005**. Four copies of your best and most representative publications should be sent at the same time to: FAS, att: Kerstin Carsjö, Box 2220, 103 15 Stockholm. Please include a copy of your survey response in the letter/parcel. For more specific instructions please refer to the attached questionnaire. If you have any questions please contact Kerstin Carsjö at the above e-mail address or at 08-775 40 89.

Thank you in advance for your cooperation.

With best wishes,

Rune Åberg, Professor
Secretary General, FAS

Michael Drummond, Professor
Chair of evaluation group

Evaluation of health economics research in Sweden - Follow-up questions to research units/groups

Name, position, phone number and e-mail address of respondent (if possible the same as in the previous survey):

Name and address of department/unit/group (please use the same as in previous survey):

PhD's

- Please list the persons who have received a PhD degree in the area of *health economics* from your department/unit from 2000 onwards. List the person's full name, title of his/her thesis, year of PhD, major discipline (of basic education, e.g., medicine, economics etc) and current employment. If you do not know the person's current employment please indicate the person's last known e-mail address or any other contact information you may have.

| Name | Thesis title | Year of PhD | Discipline | Current employment |
|------|--------------|-------------|------------|--------------------|
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Sources of external funding

- As the direction of research in an area is partly determined by the resources available, we would now like to know a little more about *the sources of your external funding*. In the previous survey you indicated your unit's budget for *health economics research* during 2004 (including salaries and social fees). You were asked to separate the budget into a) internal (i.e., faculty and ALF funds) and b) external grants (after deduction for university costs.) Please specify below the name of the source and the amount of external funds received during 2004 in the following categories: research council/foundation; other public source (county councils etc); private industry. In order to correspond with your previous reply please deduct university costs from the amount received.

| Research council/foundation | Other public funds | Private industry |
|-----------------------------|--------------------|------------------|
| | | |
| | | |
| | | |

If you would like to make any comments to the above or make any additional comments on the availability of funds for health economics research in Sweden please do so below.

Publications

3. In the previous survey you were asked to list the publications from your research unit/group in the area of *health economics* during the past five years, i.e., from 2000 on. The list was to be separated into a) publications in refereed journals (include submitted manuscripts) and b) other publications. We would now like you to do three things:
 1. Please go over the list you submitted with your colleagues to make sure that you have not omitted any publications. If you find that you have please add those publications to the list. Submit your list again in the indicated space below.
 2. Please indicate up to *five of the most important health economics* publications from the perspective of **scientific quality** and up to *five of the most important health economics* publications from a perspective of **policy relevance** from your unit. Put “**SQ**” in front of the *scientific quality* publications and “**PR**” in front of the *policy relevance* publications of your choice on the list. (The categories may overlap, in which case you put both SQ and PR in front of the publication.)
 3. Please choose up to *five of the best and most representative publications* in the area of health economics research from your unit. These publications should be marked in **bold** (fetstil) on the list. (These publications may of course overlap with those selected above). The publications should be submitted in *four copies* by mail to: FAS, att: Kerstin Carsjö, Box 2220, 103 15 Stockholm. Please include a copy of your list of publications in this mailing.

List of publications:

- a) Publications in refereed journals
- b) Other publications

Thank you for your co-operation! Unless you indicate otherwise, your response will be stored in a computerised register.



Evaluation of health economics research in Sweden – Units included and responses to inventory and follow-up surveys

| Univ/dept/unit | Inventory survey | | Included in follow-up survey |
|--|------------------|------------------------------|------------------------------|
| | Response | Comment | |
| Göteborg university | | | |
| School of Economics, Dept of Economics | X | Complete | Yes |
| Centre for Health Systems Analysis (CHSA) | X | Complete | No |
| Centre for Public Sector Research (CEFOS) | X | Complete | No |
| Karolinska institute | | | |
| Dept of Medical Epidemiology and Biostatistics (MEB) | X | Complete | No |
| Dept of Public Health Sciences; Social Medicine | X | Complete | Yes |
| Dept of Public Health Sciences; IHCAR | | | |
| Centre for Allergy Research (CFA) | | | |
| Dept of LIME; Medical Management Centre | | | |
| Stockholm County Council Centre for Public Health; Social Medicine and Epidemiology | | | |
| Dept of Medicine (MED)* | | | |
| Institute of Environmental Medicine (IMM)* | | | |
| Neurotec; Geriatric Epidemiology; Centre for Gerontology and Health Economics | | | |
| Neurotec; Aging Research Center (ARC) | X | Complete | Yes |
| Linköping university | | | |
| Dept of Economics | (X) | No health economics research | No |
| Dept of Health and Society; Center for Medical Technology Assessment (CMT) | X | Complete | Yes |
| Dept of Health and Society; Primary Care | X | Complete | No |
| Lund university | | | |
| Dept of Clinical Sciences, Section for psychiatry, primary care and public health, Malmö | X | Complete | Yes |
| LUCHE, Dept of Health, Care and Society and Dept of Economics | X | Complete | Yes |
| The Vårdal Institute | X | Complete | Yes |
| Stockholm universities | | | |
| <i>Stockholm university:</i> | | | |
| School of Business, Institute of Local Government Economics (IKE) | (X) | No health economics research | No |
| Swedish Institute for Social Research (SOFI) | (X) | No health economics research | No |
| Centre for Health Equity Studies (CHESS) | (X) | No health economics research | No |
| Centre for Social Research on Alcohol and Drugs (SoRAD) | (X) | No health economics research | No |

| Univ/dept/unit | Inventory survey | | Included in follow-up survey |
|---|------------------|------------------------------|------------------------------|
| | Response | Comment | |
| and Stockholm School of Economics, Dept of Economics, Centre for Health Economics (CHE) | X | Complete | Yes |
| Umeå university | | | |
| Dept of Economics | X | Complete | Yes |
| Dept of Public Health and Clinical Medicine; Epidemiology and Public Health Sciences | X | Complete | Yes |
| Uppsala university | | | |
| Dept of Business Studies | - | No response | No |
| Dept of Economics | X | Complete | Yes |
| Dept of Public Health and Caring Sciences | (X) | Incomplete | No |
| Dept of Pharmacy; Pharmacoepidemiology and pharmacoconomics | X | Complete | No |
| Other universities/colleges | | | |
| Karlstad University, Division for Social Sciences; Public Health Sciences | (X) | No health economics research | No |
| Karlstad University, Division for Business and Economics | (X) | Incomplete | No |
| Växjö University College, School of Economics | (X) | Incomplete | No |
| Örebro University, Dept of Business, Economics, Statistics and Informatics | X | Complete | No |
| Nordic School of Public Health | (X) | Incomplete | No |
| Mälardalen University, School of Business Research Unit | X | Complete | Yes |
| Other | | | |
| National Institute of Public Health (NIPH) | X | Complete | No |
| National Board of Health and Welfare, Centre for Epidemiology | X | Complete | No |
| National Board of Health and Welfare, Unit for Follow-up and Evaluation | (X) | No health economics research | No |
| Network for Pharmacoepidemiology (NEPI) | X | Complete | No |
| Swedish Council on Technology Assessment in Health Care (SBU) | X | Complete | No |
| Swedish Institute for Health Economics (IHE) | X | Complete | Yes |
| Pharmaceutical Benefits Board | X | Complete | No |

| | |
|---|----------|
| Summary of inventory survey response | N |
| Completed questionnaires | 24 |
| Response: no health economics research | 7 |
| Incomplete response | 4 |
| No response | 1 |
| Total | 36 |

| | |
|---|----------|
| Summary of follow-up survey response | N |
| Completed questionnaires | 13 |
| No response | 0 |
| Total | 13 |

Appendix B – Research unit descriptions

This appendix contains descriptions of the individual university research units and one research institute: Institute of Health Economics (IHE). IHE has been included due to its close ties and collaboration with the Lund university.

Lund University

LUCHE

Health economics at Lund University dates back to the late 1940s; in its present modern form to the early 1970s and is, hence, the oldest health economics research group in Sweden. Lund University Centre for Health Economics (LUCHE) was established in 1988 by the Vice-chancellor (Rektor) of Lund University to strengthen the development and competitiveness of Lund University in the field of health economics. Main objectives of LUCHE are: to create a meeting place for researchers and research students, to organize a forum for international contacts and information, to provide a partner in relation to the financing of health economics research, and to inform about health economics research and education at Lund University. LUCHE is a virtual centre, a centre “without walls”, and participating departments presently include business administration, clinical sciences (Lund and Malmö), economic history, economics, ethnology, health sciences, industrial design, laboratory medicine, mathematical statistics, political science, psychology, social work, sociology, and technology and society.

The Vårdal Institute

In 2002 the Vårdal Institute for research, development, and communication on health and social care, was established. The Vårdal Institute is a national virtual environment with its core activities at the Lund and Göteborg universities. It is funded by the Vårdal Foundation, the universities in Lund and Göteborg, and the health care regions of Skåne and Västra Götaland. Its senior researchers (about 50), and especially the PhD students (also about 50), come from universities all over Sweden. When it comes to health economics, the connection to LUCHE is very strong. Professor Björn Lindgren is heading both LUCHE as well as one of three research programmes of the Vårdal Institute and one of the Associate Professors as well as two of the Research fellows work at both institutes. Health economics is an essential theme of all the three programmes, though.

Number of researchers in different positions and working time in health economics research (in full-time equivalents)

| University unit | Professor | | Associate Professor | | Research fellow*) | | Total time | PhD students | |
|-----------------------------------|----------------|------|---------------------|------|-------------------|------|------------|----------------|------|
| | No. of persons | Time | No. of persons | Time | No. of persons | Time | | No. of persons | Time |
| Lund University/ LUCHE | 5 | 1.60 | 4 | 1.70 | 12 | 6.85 | 10.15 | 6 | 4.00 |
| Lund University/ Vårdal Institute | 1 | 0.50 | 1 | 0.25 | 5 | 1.35 | 2.05 | 10 | 3.70 |

*) including, Adjunct Professor, Assistant Professor, Senior Lecturer and Lecturer

Financial resources

| Unit | Internal budget | External budget |
|------------------------|-----------------|-----------------|
| Lund University /LUCHE | SEK 1.5 million | SEK 5 million |
| Vårdal Institute | SEK 3 million*) | SEK 0.5 million |

*) including funds allocated by collaborating universities

Sources of external funding mentioned included: Länsförsäkringar Research Foundation, Swedish Cancer Society, Swedish Council for Working Life and Social Research (FAS), Swedish International Development Cooperation Agency Department for Research Cooperation (SAREC), Trygg Hansa Research Foundation, Vårdal Foundation and the Swedish Association of Health Professionals (Vårdförbundet).

Comments to the question of external funding :

“The consensus – maybe with a few exceptions - among applied economists in Sweden seems to be that it has become much more difficult to get funds from FAS than it used to be to get funds from its forerunner, the Swedish Council for Social Research (SFR). Since the Swedish Research Council (Humanities and Social Sciences) gives priority to basic economic research, this makes it difficult to raise funds, inter alia, for health economics research, if the research group does not want to become dependent on industry or government money. The Swedish Research Council (Medicine) makes a welcome contribution since many years by financing a position as senior research fellow in health economics, which was first held by Carl Hampus Lyttkens at Lund University and presently held by Magnus Johannesson at the Stockholm School of Economics. The Apoteket Foundation for Research and Studies in Health Economics and Social Pharmacy gives priority to studies on the use of pharmaceuticals, which is alright if you have such interests, but it certainly limits the scope for health economics research. Today, the single largest contributor to health economics research among the research councils/foundations seems to be the Vårdal Foundation through its institute for strategic health- and social care research, the Vårdal Institute; see the evaluation from the Vårdal Institute. Our LUCHE group has occasionally had research projects financed by government (for instance, the Swedish National Institute of Public Health) or industry (pharmaceutical companies), but not in 2004 (or in 2005).”

Research – current programme, key achievements and plans at LUCHE

The research at LUCHE is devoted to a broad variety of economic research issues:

1. Individual health behaviour – demand-for-health model.
2. Interactions between the individual behaviour and family structure, working conditions, environment, and society at large.
3. Ethics/altruism – analysis of concepts and rules for priority setting and equity in health.
4. Development and diffusion of technologies for health.
5. Economic evaluation of technologies for health.
6. Instruments for measuring population health, including trade-off between individual health and the distribution of health in the population.
7. Organization and management of healthcare services.
8. Systems for health care delivery and finance in rich and poor countries.

Key achievements pointed out by the unit are:

Theoretical contributions: Extensions of the Grossman model. Multidisciplinary work, developing the theory of individual health behaviour, combining economics and sociology and using qualitative methods.

Methodological contributions: Refinements of the methodology for economic evaluation of interventions for health.

Empirical contributions: Estimations of the extended Grossman model and other studies of the determinants of health, risk perceptions and their role in risky health behaviour, measurements of inequalities in health, and the application of refined methodologies for economic evaluation of interventions in health.

Plans for the future are to continue and develop

- The demand for health model to comprise risk, social security and the demand for private insurance, the simultaneous investments in health and education, long-standing illness, public-health policies, etc. – theory and empirical applications
- Analysis of interactions of individual health behaviour and family structure, working conditions, etc. - theory and empirical applications
- Analysis of the dynamics in interactions between the individual health behaviour, institutional behaviour, and technologies for public health - theory and empirical applications
- Equity in health – theoretical analysis of concepts and priority rules as well as empirical estimates of inequities
- Economic evaluation of public health policies – theoretical basis and methodology
- Instruments for measuring population health – further development
- A micro-simulation model for the Swedish population aged 50+ in order to facilitate analysis of various changes in the individual life and in the society
- Empirical analysis of the importance of individual health-related behaviour and its interaction with institutions and culture – a European policy perspective
- Theoretical and empirical analysis of health care organization and management
- Theoretical and empirical analyses of systems for health care delivery and funding in rich and poor countries, including their impact on distribution of health in the population.

Research – current programme, key achievements and plans at the Vårdal Institute:

The research at the Institute is multidisciplinary and is separated into three major programmes or platforms: 1) Elderly, their care and nursing; 2) Persons with long-term somatic illness and functional disabilities; 3) Persons with long-term mental illness or functional disabilities. So far the first two have developed health economics research with special emphasis on the elderly and on people with longstanding illness or handicap within the main areas of:

1. Individual health behaviour.
2. Interactions between individual health behaviour, family structure and health and social services.
3. Ethics/altruism – analysis of concepts and rules for priority setting and equity in health.
4. Economic evaluation of technologies for health.
5. Organization and management of health and social care.
6. Systems of health care delivery and funding.

Due to the recent start of the Vårdal Institute there are no key achievements from the research to be reported on yet. The plans for the future research are to continue the current programmes and the areas described above.

Research – applied contributions and research collaboration

LUCHE

Researchers from the participating departments have been and are members of different advisory boards, working groups and committees, both nationally and internationally.

The centre and its participating researchers have an extensive collaboration and co-operation both nationally with authorities and other health economics researchers, and internationally.

Vårdal Institute

Due to the recent start there are not any applied contributions to be reported yet from the Institute. The collaboration is already substantial nationally within the Institute. Given its recent start, international collaboration has not yet been developed. Collaboration with the University of Southern Denmark in Odense is developing, though.

Health Economics Programme, Department of Clinical Sciences, Section for Psychiatry, Primary care and Public Health, Lund University

The Health Economics Programme at the Department of Clinical Sciences started in 2005 and is located at Malmö University Hospital.

Number of researchers in different positions and working time in health economics research (in full-time equivalents)

| University unit | Professor | | Associate Prof | | Research fellow*) | | Total time | PhD students | |
|---|----------------|------|----------------|------|-------------------|------|------------|----------------|------|
| | No. of persons | Time | No. of persons | Time | No. of persons | Time | | No. of persons | Time |
| Health Economics Programme, Section for Psychiatry, Primary Care and Public Hlth, Lund University | 1 | 1.00 | - | - | 2 | 1.50 | 2.50 | 3 | 2.50 |

*) including, Adjunct Professor, Assistant Professor, Senior Lecturer and Lecturer

Financial resources

The internal budget for 2004 was SEK 800.000, and the external funding was SEK 500.000. Sources of external funding were: Swedish Council for Working Life and Social Research (FAS); SIDA/SAREC; Primary care fund of the Medical Faculty, Lund university; Ministry for Social Affairs (part time funding for a PhD student).

Research – current programme, key achievements and plans

The research programme covers:

1. Analyses of economics of preventive medicine and promoting measures.
2. Studies of demand for health care and health.
3. Cost-effectiveness of medical interventions and equity analyses.
4. Applied work. Policies for decision making.
5. Health and business cycles.
6. Evaluation of health systems, programmes and treatments including productivity analysis (areas: alcohol and obesity).

Key achievements:

- Income, relative income, income inequality and health.
- Business cycle variation and health.
- Inequalities in self assessed health and survival.
- Unemployment and health.
- Hospital level and neonatal mortality.
- Aging, health services and taxes.
- Productivity and efficiency of health systems.
- Do life saving regulations save lives?

To the question about future research the department has chosen the following headings:

- Health and inequality.
- Cost of alcohol use and economic evaluation.
- Cost of obesity, food demand & policies.
- Cost-effectiveness of diabetes treatment.
- Globalization and health

Research – applied contributions and research collaboration

Applied contributions from the Department are:

- Analyses and prognoses of the pharmaceutical consumption for the National Board of Health and Welfare.
- Discussion and analysis of interventions to reduce the number of wasted drugs - National Board of Health and Welfare
- Work on neonatal care services for the WHO

The department has an extensive collaboration with other researchers and organizations ranging from other local departments to other research centres in Sweden and international universities and research organizations.

NEPI

The Network for Pharmacoepidemiology (NEPI) is a foundation for effective use of pharmaceuticals in Sweden. The foundation is located at Lund University. Their work is funded by the Ministry for Social Affairs. There is no separate budget for the research in health economics.

Two of the researchers at the unit work in health economics with a total time of 0.3 fulltime equivalent. There are no PhD students at the unit.

The health economics research at NEPI is applied work in pharmacoeconomics and the key achievements referred to is comparative studies on international differences in pricing, costs and efficiency of pharmaceutical drugs. Future research work at NEPI will also address comparisons of efficiency of non-pharmacologic and pharmacologic treatments of life-style disorders.

On the question of policy contribution the unit mentioned that the health economics research at NEPI has influenced the decision on mandatory exchange at the pharmacy level to cheapest generic drug. NEPI is also engaged in consultations with county councils.

The Swedish Institute for Health Economics (IHE)

IHE, which started its mission in 1979, is a free-standing organization with a mission to

- conduct research and investigations in the area of health economics
- be a forum for contacts between the academy and different actors within the health care organization
- inform about new research and investigations within the field of health economics through conferences and publications.

The founders of the IHE were the Association of Swedish Pharmaceutical Industry and the Association of Representatives for Foreign Pharmaceutical Industries. In 1988 the National Corporation of Swedish Pharmacies took over Institute. Pharmacoeconomics have therefore been one of the major research areas within the Institute.

Number of researchers in different positions and working time in health economics research (in full-time equivalents)

| Research unit | Professor | | Associate Professor | | Research fellow/-project manager | | Total time | PhD students | |
|--|----------------|------|---------------------|------|----------------------------------|------|------------|----------------|------|
| | No. of persons | Time | No. of persons | Time | No. of persons | Time | | No. of persons | Time |
| Swedish Institute for Health Economics (IHE) | - | - | 1*) | 0.50 | 9 | 7.30 | 7.80 | 3**) | 3.00 |

*) At the Department of Business Administration, Lund University School of Economics and Management

***) Two at the Department of Business Administration, Lund University School of Economics and Management

Financial resources

The total turnover in 2004 for applied research and consultancy was approx. SEK 14 million. 10-15 percent of the resources came from research grants, 50 percent came from other public funds and 40 percent came from the private industry.

Research – current programme, key achievements and plans

At present the IHE conducts health economics research in the following areas:

1. Evaluation of pharmaceuticals and medical technology.
2. Organization and financing of health care.
3. The pharmaceutical market.
4. Health care in developing countries.
5. Value of life and health.

Key achievements in the research at the IHE is briefly described in the survey as:

Methodological: Contribution to measurement of the value of risk reduction and value of statistical life and life-years. Contribution to methodological development of National Health Account framework.

Empirical: Estimations of the value of risk reduction and the value of statistical life and life-years. Empirical studies of the economics of diabetes, cancer and other disease-areas. Studies of priority setting in practice. Population and patients preferences regarding choice and participation in decision-making. Determinants of health care utilization and individual preferences.

Future plans for research at IHE include:

- Continued research work in major disease areas.
- Value of risk reduction and statistical life and life-years.
- Economic evaluation and its contribution to decision-making and priority setting.
- Consumer choice and health/social care (experiments).
- Resource allocation and payments of providers (including conditions in developing countries).
- The EURODALE project - publication of results.

Research – applied contributions and research collaboration

IHE is very active in commissioning and communicating health economics research to the health service organizations in Sweden. They have been involved in many projects at local, national and international level, and have given many examples of this work in their answer. Below is a summary of their applied contributions to health policy.

1. Support to health policy development in local governments through commissioned work and participation in committees/boards etc.

2. Support to health policy development nationally through commissioned work, participation in councils/committees and by network activities.
3. Initiation and leadership of the "Swedish Network for Applied Health Economics" (150+ members and two annual meetings since 2002)
4. Organizer of the annual conference IHE-forum since 1993
5. Newsletter
6. Support to health policy development internationally through commissioned work and collaboration with WHO, the World Bank and others.

IHE's collaboration with other institutions and research settings is naturally also extensive. Examples given in the survey include:

International:

- University of Zambia (since 8 years).
- London School of Economics -Health (IMPACT-project).
- EURODALE-project partly financed by EU and including 10 countries.
- Co-author in a Dutch thesis.
- WHO -National health accounts. Partners for Health Reform*plus* in supporting implementation of National Health Accounts in low- and middle income countries.

National level:

- Lund Institute for Technology (estimation of value of risk reduction and statistical life).
- National Centre for Priorities in Health Care (empirical studies in priority setting) Lund University (care of the elderly and estimation of value of risk reduction and statistical life).

Göteborg University

The Department of Economics at the university in Göteborg has not been participating in the development of health economics research to the same degree as the other large universities in Sweden. The research group in health economics at the economics department in Göteborg is a quite new group, and the same goes for the Centre for Health Systems Analysis (CHSA) which started in 2000. However CHSA, which is funded by Göteborg University, the Region of Västra Götaland and the Nordic School of Public Health, is mainly a centre for assessment and evaluation, research is a secondary activity.

The Centre for Public Sector Research (CEFOS) is a research unit at the Göteborg School of Public Administration, which is a part of Göteborg University. At the School of Public Administration a new research unit for studies of organization, management and economics of the health and caring services was formed recently. However, this unit was not included in the mailing list of this survey.

Number of researchers in different positions and working time in health economics research (in full-time equivalents)

| University unit | Professor | | Associate Professor | | Research fellow*) | | Total time | PhD students | |
|---|----------------|------|---------------------|------|-------------------|------|------------|----------------|------|
| | No. of persons | Time | No. of persons | Time | No. of persons | Time | | No. of persons | Time |
| Göteborg Univ., Dept of Economics | 1 | 0.10 | 2 | 0.30 | 6 | 1.65 | 2.05 | 1 | 0.50 |
| Göteborg Univ., Centre for Public Sector Research (CEFOS) | - | - | - | - | 3 | 1.30 | 1.30 | - | - |
| Göteborg Univ., Centre for Health Systems Analysis (CHSA) | 1 | 0.2 | - | - | - | - | 0.2 | 4** | 1.5- |

*) including, Adjunct Professor, Assistant Professor, Senior Lecturer and Lecturer

***) 2 at Nordic School of Public Health and 2 at Göteborg University (medical faculty).

Financial resources

| Unit | Internal budget | External budget |
|-------------------------|-----------------|-----------------|
| Department of Economics | - | SEK 500.000 |
| CEFOS | - | SEK 700.000 |

The Department of Economics made the following comments on sources of external funding in the follow-up survey:

“At the department, the research has traditionally been concentrated to units focusing on econometrics, labour, development and environmental economics, and thus funding have been to projects within these sub-disciplines of economics (these boundaries are now disappearing). However, within labour and econometrics funding have been received to do research on sickness and absenteeism from work, and in development and environmental to conduct larger household surveys where health is a part (e.g. we ran a survey among 1600 households in rural Ethiopia in June 2005). Moreover, the department has over the years received funding to research on transport, where one part has focused on value of statistical life. In addition, some of our PhD students in economics write their thesis on topics in health economics, but their funding are not for specifically targeted to health economics. Thus, our specific budget for health economic research is close to zero, but funding for the research where output could be classified as health economic research is in the range of several million SEK.”

CHSA has not given any explicit information on their funding. Their basic resources comes from the county of Västra Götaland and the Nordic School of Public Health as well as The Swedish Association of Local Authorities and Regions (SALAR). In addition the Centre gets funding from other counties and care providers whose activities are assessed and evaluated in projects run by CHSA.

Research – current programme, key achievements and plans

Department of Economics

The main areas of the current research at the Department are:

1. Sickness absenteeism, rehabilitation and involuntary job loss.
2. Stated preference methods.
3. Equity and equality in health

The department has recently started research in health economics and can not report any key achievements. Their plan for the future five years is to continue with the three areas.

Centre for Public Sector Research (CEFOS)

The research at CEFOS is devoted to:

1. Health care insurances for individuals born with disability or who have developed health problems at an early age.
2. Evaluation of the attitudes towards European sickness insurance systems.
3. Comparisons of patients' rights in Sweden and England.

CEFOS key achievements mentioned in the response are:

- Applying institutional theory in explaining differences in patients' rights in the Swedish and British health care systems.
- Empirical research on rights and accountability in the Swedish and British health care systems.

Plans for the future at CEFOS include research on health care insurances and attitudes towards European insurances.

Göteborg University, Centre for Health Systems Analysis (CHSA)

The research in health economics is focused on policy, management and integration between providers.

Research – applied contributions and research collaboration

Department of Economics

Due to the recent start of the research in health economics there are no examples of contributions to health policy yet. The department collaborates with the Swedish Social Insurance Agency in projects regarding sickness absenteeism, disability and rehabilitation.

Centre for Public Sector Research (CEFOS)

Participation in the evaluation of the Swedish insurance programmes together with the Swedish Social Insurance Agency is one of the examples of applied work reported in the survey by CEFOS.

Centre for Health Systems Analysis (CHSA)

Applied contributions to health policy are the main task at CHSA. The methods used for this are written reports, published papers, conferences, seminars and participation in national and regional committees. All reports are joint efforts with national and regional government agencies as well as university units

Linköping University

The Centre for Medical Technology Assessment (CMT) is a multidisciplinary research centre at the Faculty of Health Sciences. It was established in 1985. Today around twelve persons are engaged in health economics research and education. Closely connected to the centre is the National Centre for Priority Setting in Health care. Per Carlsson, Professor of Medical Technology Assessment at CMT, is heading the work at the priority centre. There are plans to move the centre to the university within the next two years.

The research in health economics at the Section for Primary care is minor and strongly connected to the work by Professor Lars Borgquist.

Number of researchers in different positions and working time in health economics research (in full-time equivalents)

| University unit | Professor | | Associate Professor | | Research fellow*) | | Total time | PhD students | |
|----------------------|----------------|------|---------------------|------|-------------------|------|------------|----------------|------|
| | No. of persons | Time | No. of persons | Time | No. of persons | Time | | No. of persons | Time |
| CMT | 2 | 0.75 | 1 | 0.80 | 4 | 2.60 | 4.15 | 5 | 3.30 |
| Dept of Primary Care | 1 | 0.1 | - | - | - | - | - | 1 | 0.25 |

*) including; Adjunct Professor, Assistant Professor, Senior Lecturer and Lecturer

Financial resources

| Unit | Internal budget | External budget |
|----------------------|-----------------|------------------|
| CMT | SEK 600 000* | SEK 2 700 000 ** |
| Dept of Primary Care | - | - |

*) The department has no funding from the faculty except for funding of doctoral students and some strategic funds for development of strong research areas at the department. There was around 100 000 SEK allocated for health economic related activities (pilot studies, education) in 2004

**) The budget is estimated based on actual salaries and time allocated to health economics among the staff and doctoral students.

CMT has given the following specification for the external funding at the centre.

| Research council/foundation | Other public funds | Private industry |
|--|--|-------------------------------|
| Research programme on changes in health care (SALAR, Natnl Board of Health and Welfare et al) SEK 800 000. Part of the project (30%) could be perceived as HE. | National Board of Health and Welfare SEK 150 000 | Scheering SEK 120 000 |
| National Corporation of Pharmacies Foundation for health economic and social pharmacy research: SEK 140 00 | Pharmaceutical Benefits Board SEK 65 000 | Johnson & Johnson SEK 147 000 |
| | SBU 336 000 | AstraZeneca SEK 113 000 |
| | Course in HE (fees) 100 000 | |
| | County council of Östergötland SEK 1 286 000 | |

The following comment was given by CMT to the question of external funding in the follow-up survey:

“It is somewhat difficult to exactly define the budget for HE a particular year. We have made an estimate based on the actual income from external sources 2004 after deduction for university costs of 16 percent. Beside the 100 000 from the faculty mentioned earlier three of the doctoral students working fulltime or part time in HE were financed by the faculty during 2004.

The National Corporation of Swedish Pharmacies Foundation for research and studies in health economics and social pharmacy has been a important source for funding doctoral studies. We are informed that this source will soon come to an end. FAS public health program is one source in theory but have had a focus on epidemiology. Other sources beside FAS are of incidental nature.”

Research – current programme, key achievements and plans

Centre for Medical Technology Assessment (CMT)

Research areas at CMT include:

1. Economic evaluation of heart diseases including health economic randomized controlled trials.
2. EBM or economic evaluations as a base for policy decisions.
3. Empirical and theoretical studies of the inclusion of “next to kin QALYs” in evaluations.
4. Priority setting - balance between needs and cost-effectiveness in decision making.
5. Cost-of -illness in AD/HD and related disorders.
6. Diffusion and economic consequences of health technologies in management of prostate cancer.

Key achievements reported by the CMT are:

- Methods for including health economic sub studies to clinical trials.
- Economic evaluations in treatment of unstable angina. Conducting the clinical FRISC-II health economic studies including 3 500 patients.
- Disease specific transformation equations to enable transformation of SF-36QoL profiles to QALY-weights for unstable angina and heart failure.
- Contribution to the theory and empirical studies of the cost of informal care.

To the question of future plans for the next five years, the CMT mentions the following areas:

- Health economic evaluations; continue to do allied work but also investigate how the results can be linked to decision making.
- Methodological issues in economic evaluation.
- Diffusion of new and emerging technologies
- Priority setting in health care.

Research Unit for Primary Care

Areas of health economics research conducted at the unit are; decision making, altruism, economic evaluation, organizational theory and priority setting in health care.

The unit's research achievements is described as:

Theoretical: A multidisciplinary analysis of the concept of health oriented altruism (HOA) with an emphasis on economics.

Methodological: Methods for evaluating HOA.

Empirical: Studies indicate that altruism is related to needs and paternalistically health oriented. Policy implications: more resources to health care than is advocated by standard economic theory.

The unit plans to continue the research on the decision making process and altruism.

Research – applied contributions and research collaboration

Centre for Medical Technology Assessment (CMT)

The centre has an applied profile and there are a lot of collaborations and contacts with national health agencies and other organizations in the society. People from CMT are involved in health policy processes both as members of committees and in the role of supporting decision making bodies with scientific information.

The collaboration mainly takes place with the following organizations:

1. Extensive collaboration with departments at the University Hospital as well as other hospitals in Östergötland.
2. Collaboration with other departments at other hospitals in Sweden

3. Internationally with York University (UK), University of Kuopio and the FRISC-group (Nordic clinical research group for cardiovascular diseases)

Research Unit for Primary Care

No examples of contributions to health policy are described in the answer from the unit. On the question of collaboration Stockholm School of Economics and CMT in Linköping are mentioned.

Stockholm School of Economics

In Stockholm there are two main actors in health economics research – the Stockholm School of Economics and the Karolinska Institute. The Centre for Health Economics at Stockholm School of Economics has been important for the development of health economics in Sweden, and Professor Bengt Jönsson and Associate Professor Magnus Johannesson are two well-renowned researchers in health economics internationally.

Number of researchers in different positions and working time in health economics research (in full-time equivalents)

| University unit | Professor | | Associate Professor | | Research fellow*) | | Total time | PhD students | |
|--|----------------|------|---------------------|------|-------------------|------|------------|----------------|------|
| | No. of persons | Time | No. of persons | Time | No. of persons | Time | | No. of persons | Time |
| Stockholm School of Economics, Centre for Health Economics | 2 | 0.40 | 1 | 1.00 | 3 | 3.00 | 4.40 | 3 | 2.00 |

*) including; Adjunct Professor, Assistant Professor, Senior Lecturer and Lecturer

Financial resources

| Unit | Internal budget | External budget |
|--|-----------------|-----------------|
| Stockholm School of Economics, Centre for Health Economics | SEK 350.000 | SEK 1.5 million |

In the follow-up the Centre made the following comments to the question of sources of external funding:

“CHE had a grant from National Corporation of Pharmacies Foundation for research in health economics and social pharmacy since 1991 of SEK 2.2 million per year in 1991 prices. This was terminated in 2004 due to lack of fund and changing priorities. Present external funding includes: Swedish Research Council (Prof. Magnus Johannesson), a fulltime position; National Corporation of Swedish Pharmacies Foundation, one scholarship for a PhD who will finish this year.

Presently we have private funding as a complement for the salary to one assistant professor, one post-doc and one PhD student. Most of it (SEK 60.000) comes from a joint project on health economics of cancer, funded by Roche. This is seen as a temporary solution only.

Since the mission of CHE is research and education, and not contract research and consultancy, private funding has played a very minor role over the last 15 years. Participation in policy related research, funded by the government, county councils or private organizations like SNS have been undertaken at individual basis, usually during leave of absence, sabbaticals or summer vacations.

It is rather obvious that without secure “basic funding” for academic positions, post docs, and PhD students, there is no future for a research unit like CHE. Without a basic grant it is impossible to generate the “extra funding” through for example executive education, a major source of income for the CHE during the 1990s and specific project related research, including some policy research.”

Research – current programme, key achievements and plans

Current research areas at the centre are:

1. Economic evaluation of health care programmes and the value of health. Applied studies, modelling techniques for assessment of uncertainty in economic evaluation. Value of a statistical life and the value of a QALY.
2. Pharmaceutical economics and pricing of new drugs.
3. Determinants of health and inequality in health, based on Grossman model on demand for health. Methods for measuring health (QALYs).
4. Experimental economics and health. Paternalistic altruism, effects of monetary incentives on crowding out altruistic incentives.
5. Peer-group effects.
6. Adverse selection and moral hazard in health insurance.

Key achievements from the research at the Centre mentioned in the survey include:

- Economic evaluation of health care programmes and the value of health. Modelling techniques and methods for the analysis of uncertainty - net-benefit approach. Empirical studies have led to increased knowledge on quality of life and costs related to different diseases in the areas of study, e.g., osteoporosis and related diseases.
- Adverse selection and moral hazard in health insurance. The empirical work by Erik Grönqvist.
- Experimental economics and health. Tests to see if altruism is paternalistic.

Except for continuing with the current programmes of research, there are plans at the Centre to do research on;

- Estimation of the societal value of eliminating diseases in Sweden with a proposal for a new framework for the estimation of societal costs of diseases which is consistent with economic theory and intuitively compelling.
- Presentation of a framework for eliminating selection bias in non-randomized evaluations of health intervention programmes by using methods from evaluations in labour market programmes.

Research – applied contributions and research collaboration

On the question of major applied contributions the Centre responded as follows: “Our research is often cited, which is confirmed in that Magnus Johannesson and Bengt Jönsson are included in "Who's who" for Economics. Further, Bengt Jönsson is president of the IHEA for 2005. IHEA is formed to increase communication among health economists and to foster a higher standard of debate in the application of economics to health and health care systems. Bengt Jönsson was also a key note speaker at the European Health Economists' congress in Paris in 2002.”

During the last couple of years a fruitful collaboration between the Centre for Health Economics and the Karolinska Institute has developed. Supervisors from the Centre and Karolinska have co-operated in the examination process of PhD students in the doctoral programme located at Karolinska. The co-operation has resulted in several publications and constitutes a solid base for future extended collaborations between the two working groups.

The Centre also has and has had extensive international collaboration. There is also an intention at the Centre to build a network among other health economics research groups

working with similar questions. The collaboration will be based on specific studies and projects.

Karolinska Institute

At Karolinska the health economic research is integrated into different research settings and departments, but the Medical Management Centre (MMC), (director Prof Mats Brommels) has become a “meeting-place” for the researchers in health economics at the institute. A sign of this role of connecting the different departments is that the response to the survey from six of the departments at Karolinska was merged into one submitted coordinated by Associate Professor Clas Rehnberg at the MMC. An important role is also played by the Stockholm Centre for Public Health, Stockholm County Council. The Centre is integrated with the Department of Public Health at Karolinska, which runs a one-year masters programme in health economics.

As mentioned above, there is also an intensive co-operation in health economics research between the Stockholm School of Economics and the Karolinska Institute, both in different programmes and in the education and training of PhD students.

Except for the response from the MMC, two other departments at the Karolinska have responded: the Department of Medical Epidemiology and Biostatistics (MEB) and the Neurotec Aging Research Center at Huddinge Hospital. They both do some applied health economics in their research, but do not have any formal education or training of health economists. However, MEB do give some seminars and short courses mostly with physicians as attendants.

In 2002 the Centre for Allergy at Karolinska took the initiative to create a network in health economics for researchers or others working in the field in the Stockholm area.

Number of researchers in different positions and working time in health economics research (in full-time equivalents)

| University unit | Professor | | Associate Prof | | Research fellow*) | | Total time | PhD students | |
|--|----------------|------|----------------|------|-------------------|------|------------|----------------|------|
| | No. of persons | Time | No. of persons | Time | No. of persons | Time | | No. of persons | Time |
| Karolinska Inst: Medical Management Centre/LIME | 1 | 0.1 | 1 | 0.5 | 1 | 0.20 | 0.7 | 4 | 2.00 |
| Karolinska Inst.: Dept of Public Health Sciences, Social medicine | - | - | 1. | 0.25 | 1 | 0.20 | 0.45 | 3 | 1.50 |
| Karolinska Inst; Centre for Allergy Research (CFA) | - | - | - | - | - | - | - | 1 | 0.25 |
| Karolinska Inst: Sthlm County Council Centre for Public Health; Social Med. and Epidemiology (CFF) | - | - | 1 | 0.5 | 4 | 3.50 | 4.00 | 2 | 1.5 |
| Karolinska Inst., Dept of Medicine | - | - | - | - | 1 | 0.10 | 0.10 | 1 | 0.50 |
| Karolinska Inst.: Inst. of Environmental Medicine (IMM) | - | - | - | - | - | - | - | 1 | 0.50 |
| Karolinska Inst.: Dept of Medical Epidemiology and Biostatistics (MEB) | - | - | - | - | 1 | 0.30 | 0.30 | - | - |
| Karolinska Inst.: Neurotec; Aging Research Center | 1 | 0.10 | 1 | 0.20 | 1 | - | 0.30 | 2 | 0.80 |

*) including: Adjunct Professor, Assistant Professor, Senior Lecturer and Lecturer

Financial resources

| Unit | Internal budget | External budget |
|--|------------------|-----------------|
| Karolinska Inst: LIME, PHS, CFF | SEK 2.5 million* | SEK 1.5 million |
| Karolinska Inst; Centre for Allergy Research (CFA) | - | - |
| Karolinska Inst., Dept of Medicine | - | - |
| Karolinska Inst.: Inst. of Environmental Medicine (IMM) | - | - |
| Karolinska Inst.: Dept of Medical Epidemiology and Biostatistics (MEB) | 0 | 0 |
| Karolinska Inst.: Neurotec; Aging Research Center | SEK 570.000 | SEK 100.000 |

*) All PhD students are externally funded, equivalent to approx. SEK 1,0-1,5 million per year.

Sources of external funding for LIME, PHS and CFF included:

Research council/foundation: EU/INCO, two international projects on “Health financing in South-East Asia” where the KI-part is EURO 160.000 and 190.000 respectively, for the period 2004-2007; Swedish Research Council, “Violence in Low and High Income Countries: Health economic Analysis with Public Health Approach”, SEK 500.000, 2004-2006.

Other public funds: The Stockholm County Council (the Public Health Foundation), “Economic evaluation of the Stockholm diabetes prevention programme, SEK 400.000, 2004; SIDA, “Institutional Collaboration in Health Economics between Karolinska Institute and the University of Cape Town”, SEK 600.000, 2004; The Stockholm County Council (the Purchasing Organization), Calculation of the Stockholm population-based resource allocation model, SEK 500.000 per year.

Private industry: Various support to economic evaluation, estimated to SEK 600.000 per year.

The Neurotec division at Huddinge has tried to separate the funding for health economics research but says that “Since our work is focused on both epidemiology and health economics there are grey areas in both research and funding”. They estimate that for their health economic research SEK 10.000 came from research councils/foundations, SEK 60.000 from other public funds and SEK 30.000 came from the private industry.

Research – current programme, key achievements and plans

The Karolinska Institute – Medical Management Centre, and “affiliated” departments

Areas of current research are:

1. Economic evaluation of health care programmes, collaborative work with the profession (cost-of-illness, CBA, CEA. Cost of occupational injuries and safety.)
2. Health and outcome measurement(EQ-5D and QALYs in socioeconomic subgroups)
3. Resource allocation: Efficiency and distributional effects - performance measures, benchmarking, equity in utilization and formula for funding models. Social security spending during economic business cycles and its effects on income inequality.
4. Health care financing, management and policy. Assessment of new forms of funding, regulation and organization. Safety in provision of care, costs, gender differences. Costs of occupational injuries. Cross-country studies on work-related sick-leave. Socio-economic consequences of longstanding illness - diabetes. Health problems of low and middle income countries.

Key achievements mentioned in the survey are:

- Economic evaluation modelling (methodology) a) decision tree models and Markov models, b) Calculation of excess health care utilization and excess costs of care as a function of disease duration, and the presentation of cost ratios for patients with diabetes in relation to control populations.
- Health-related Quality of Life - EQ-5D. Estimation of the monetary value of health and development of a child-friendly version of EQ-5D.
- Health economics in low and middle income countries, in particular pharmaceutical economics and equity studies.

Plans for the next five years include research on:

- Modelling in economic evaluation; cost-effectiveness studies in different therapies/socio-economic and health consequences of chronic disease as a function of time and disease duration, inclusive gender differences/economic cost of substandard quality and safety of care.
- EQ-5D tool for health development over time and in contract.
- Incentives, reimbursement and contractual relationships.
- Equity and resource allocation.

Karolinska Institute - Department of Medical Epidemiology and Biostatistics (MEB)

The health economics research in MEB is focused on applied work in evaluation of different diseases or therapies, such as cost-of-illness studies of chronic diseases.

Karolinska Institute - Neurotec; Aging Research Center (ARC)

The research in health economics at Neurotec concerns resource utilization and cost of illness of dementia (close link to ARC/DOGE/Stockholm Gerontology Centre) as well as studies of cost-effectiveness of dementia care.

Studies at Neurotec have led to two major pharmaeconomical milestones in dementia care. These are: 1) Resource utilization and costing in randomized trials with Donepezil and Memantine, and 2) Time-trade-off based health utilities for different stages of cognitive decline.

For the next five years, Neurotec plans to conduct health economics research in:

1. Cost-of -illness of dementia.
2. Cost-effectiveness studies - pharmaceuticals as well as "programmes".
3. Costing of informal care.
4. Resource utilization - RUD-instrument - translation to other languages and adoption to different care systems.

Research – applied contributions and research collaboration

The Karolinska Institute – Medical Management Centre, and “affiliated” departments

The contribution from the “consortium” of departments at Karolinska to health policy development is summarized in the following points:

- Economic evaluation of pharmaceuticals and health care investments. Research results from works on cancer, brain disorders, mental health and osteoporosis have been used by many governments for decisions on reimbursement and/or pricing policies.
- The Swedish Pharmaceutical Benefits Board - Cost effectiveness analyses carried out for subsidizing new drugs. Other national organizations and county councils also use the results. Economic evaluation of preventive measures has also been provided.
- EQ-5D as a tool for monitoring and managerial decisions. Stockholm county council.
- Support to the National Board of Health and Welfare and the National Committee on Public Responsibility.
- The Welfare Policy group at the Swedish Centre for Business and Policy Studies (SNS).
- Policy-oriented research in low and middle income countries.

Except for the collaborative work with many of the departments at Karolinska there is intensive collaboration with Stockholm School of Economics. There is also collaboration with Community Medicine in Lund, Epidemiology and Public Health in Umeå and most of the other universities in Sweden.

Several of the researchers in economic evaluation are linked as partners in the EuroNHED project, a project aimed at establishing a database with European economic evaluations. Another researcher is a member of the international multidisciplinary research group for Euro-Qol. The MMC/LIME is one of the partners in a Nordic group analyzing hospital efficiency coordinated by CHESS/STAKES in Helsinki. Health economics in low and middle income countries is a growing field, and MMC and ICHAR have developed collaboration with several universities around the world.

Karolinska Institute - Department of Medical Epidemiology and Biostatistics (MEB)

Applications of the research have been used in collaborative work with the Swedish Council on Technology Assessment in Health Care (SBU) on venous thromboembolism. The department also gives consultations to different research projects on questions relating to the feasibility of health economic studies.

Karolinska Institute - Neurotec; Aging Research Center

The research from Neurotec has been published by the National Board of Health and Welfare and the Ministry for Social Affairs. The result has also been presented at conferences at the national level. Researchers from the unit are also members in different expert groups at the Ministry for Social Affairs, OECD, SBU, and other organizations.

Swedish Brain Power is a newly established interdisciplinary centre for early diagnostics and therapy research of neurodegenerative disorders. Health economics will be one of the focus areas in the centre.

Neurotec has collaborative work with Stockholm School of Economics. They are also involved in the International Working Group for Harmonization of Dementia and Drug Guidelines. Other engagements are within the International Psychogeriatric Association and projects for EU and OECD.

Umeå University

Two main actors – the Department of Economics and the Department of Public Health and Clinical Medicine – are involved health economics research in Umeå. The two departments have a close collaboration and some of the researchers hold a post at both units.

Number of researchers in different positions and working time in health economics research (in full-time equivalents)

| University unit | Professor | | Associate Prof | | Research fellow*) | | Total time | PhD students | |
|---|----------------|------|----------------|------|-------------------|------|------------|----------------|------|
| | No. of persons | Time | No. of persons | Time | No. of persons | Time | | No. of persons | Time |
| Dept of Economics | 2 | ? | 2 | 1.00 | 2 | 0.75 | 1.75 | 3 | 2.40 |
| Dept of Publ Hlth and Clinical Med., Unit of Epidemiology and Publ Hlth Sci | - | - | 2 | 0.85 | 2 | 0.35 | 1.15 | 9 | 3.80 |

*) including; Adjunct Professor, Assistant Professor, Senior Lecturer and Lecturer

Financial resources

| Unit | Internal budget | External budget |
|------------------------------------|-----------------|-----------------|
| Department of Economics | SEK 1.020.000 | SEK 642.500 |
| Dept of Publ Hlth and Clinical Med | - | SEK 3.700.000* |

* includes SEK 1.1 million for person time allowed for research from various employers.

On the question to specify the sources of external funding the Department of Economics replied that SEK 562.000 came from the Wallander Foundation and the County Council of Västerbotten contributed with SEK 80.000.

The external funding for health economics research at the Department of Public Health and Clinical Medicine comes from the following sources: Vårdal Foundation (SEK 600.000), Sarec (SEK 150.000), WHO GHF (SEK 50.000), National Institute of Public Health and county councils (SEK 1.8 million).

Research – current programme, key achievements and plans

Department of Economics

Areas in the research programme include:

1. Selection bias in the evaluation of disease prevention programmes. Propensity score matching methods.
2. Pharmaceutical economics. Impact of uncertainty of the quality in generic pharmaceuticals on the prescription behaviour. Effects of the exchange reform in Swedish pharmaceutical market.
3. Fat taxes, unhealthy food and life-style diseases. Evaluation of policies.
4. A Mediterranean dietary intervention for patients with rheumatoid arthritis.
5. The linkages between direct expenditure on health and health insurance. Wages, insurance and health.
6. Cost-effectiveness of mass screening for celiac disease.
7. The economics of care for the elderly - net social QALY gained will be calculated.
8. Strengthening primary care as a means to lower health care costs.
9. The injury poverty trap in Vietnam - causes consequences and possible solutions.
10. Households' capacity to pay for health care and health insurance in Vietnam and households' health care expenditure and choice of health financing system in Vietnam.

As an example of key achievement the department has pointed out a theoretical paper on “Economic implications of antibiotic resistance in a global economy”.

The future research at the department will concern:

- Research on how one can use economic policy instruments in order to prevent lifestyle diseases due to over consumption of unhealthy foods and beverages.
- Development of more precise empirical methods for the evaluation of health care interventions.

Department of Public Health and Clinical Medicine: Unit of Epidemiology and Public Health Sciences

Current projects at the unit include:

1. Optimal resource allocation in the prevention of CVD.
2. Health, gender and economics.
3. The economics of care for the elderly.
4. Economic evaluation of physical exercise.
5. The economics of dental care for adolescents.
6. Cost-effectiveness of mass-screening for celiac disease.
7. Strengthening primary care as a means to lower health care costs.
8. The injury poverty trap in Vietnam -causes, consequences and possible solutions.
9. Nutrition and the quality of life for pregnant women in Bangladesh.
10. Households' capacity to pay for health care and health insurances in Vietnam.
11. Setting priorities in a county council.
12. Cost-effectiveness of laparoscopic cholecystectomy vs. minilaparotomy cholecystectomy.

Three examples of key achievements are given in the response from the unit:

- The relationship between gender equality and health. Conclusion: In particular men benefit from a relationship characterized by equality.

- The revealed value of a QALY. By investigating real decision-making it was shown that the county councils could afford interventions up to about 10 000 Euro per QALY which is significantly below the levels indicated by rules of thumb.
- The extension and magnitude of the injury poverty trap. Five years after an injury, the poor injured households still had significantly lower incomes than poor non-injured controls. Since poverty was shown to be a risk factor for injuries, the studies document the vicious circle of poverty and poor health and call for a reformation of the health care financing system.

The plans for the research at the unit in the next five years are described in detail in the response under the following three headings; 1) Efficiency aspects on health care in transition economies, 2) Health, gender and economics and 3) The value of QALY and optimal resource allocation.

Research – applied contributions and research collaboration

Department of Economics

One applied contribution mentioned by the department is a collaborative work together with the Department of Epidemiology and Public Health, for the Ministry of Health in Vietnam. The work on peoples' preferences for different health care financing schemes is likely to be used in the design of a forthcoming health care financing reform. A second work mentioned concerns the effects of selection bias in the evaluation of intervention programmes which, if the preliminary results are found to be accurate, will have policy implications in the future.

The department has a close collaboration both in research projects and education with the Department of Epidemiology and Public Health in Umeå. There is also collaboration with Hanoi Medical University. Also a collaborative work has recently been established with the Department of Food and Nutrition in Umeå. The aim of the project is to estimate the incremental cost per QALY ratio of a Mediterranean dietary intervention for patients with rheumatoid arthritis. There is also some collaboration with Södertörn University College in the field of pharmaceutical economics.

Department of Public Health and Clinical Medicine: Unit of Epidemiology and Public Health Sciences

The unit's contribution to health policy development has been the following:

1. National Committee for a New Public Health Policy – member of the group of experts.
2. Pharmaceutical Benefits Board – expert.
3. SBU - member of two different expert groups.
4. Vietnamese - Swedish collaboration in education in health economics.
5. Injury poverty trap-project.
6. There are expectations that the evaluation of unique investment in primary care will influence the county councils' policy.

As described above the unit has close connections with the Department of Economics at the University and the Hanoi Medical School.

Institutions/organizations at other universities

Three units at Uppsala University have responded to the survey. The Department of Economics and the Section for Pharmacoepidemiology and Pharmacoeconomy have responded in full, whereas the Department of Public Health and Caring Sciences has responded partially.

Both the unit at Mälardalen University College and the one at Örebro University are new centres for research in health economics.

Number of researchers in different positions and working time in health economics research (in full-time equivalents)

| University unit | Professor | | Associate Prof | | Research fellow*) | | Total time | PhD students | |
|--|----------------|------|----------------|------|-------------------|------|------------|----------------|------|
| | No. of persons | Time | No. of persons | Time | No. of persons | Time | | No. of persons | Time |
| Uppsala Univ., Dept of Economics | 3 | 1.2 | 1 | 0.20 | 5 | 4.0 | 0.20 | - | - |
| Uppsala Univ., Dept of Pharmacy, Section for Pharmacoepidem. and Pharmacoecon. | 1**) | 0.2 | 1 | 0.20 | - | - | 0.40 | - | - |
| Uppsala Univ., Dept of Pub. Health and Caring Sciences | - | - | - | - | 2 | - | - | - | - |
| Mälardalen University College, School of Business | 1 | 0.25 | - | - | 4 | 1.90 | 2.15 | 4 | 4.00 |
| Örebro University Department of Economics, Statistics and Informatics | 1 | - | - | - | - | - | - | 3***) | 3.00 |

*) including: Adjunct Professor, Assistant Professor, Senior Lecturer and Lecturer

**) exclusive of one visiting professor in medicine and economics

***) 2 started their education in 2005

Financial resources

| Unit | Internal budget | External budget |
|---|-----------------|-----------------|
| Uppsala University, Dept of Economics | SEK 80.000 | SEK 60.000 |
| Uppsala Univ., Dept of Pharmacy, Section for Pharmacoepidemiology and Pharmacoeconomics | 0 | Very small |
| Mälardalen University College, School of Business | SEK 400.000 | SEK 250.000* |
| Örebro University Department of Economics, Statistics and Informatics | 0 | ** |

*) Will increase in 2005 to SEK 2.5 million

**) One PhD student

The School of Business at Mälardalen says in a commentary in the follow-up that the external funding in 2004 came from the Government and that the budget for 2005 and 2006 will increase considerably. All the external funding came from research councils/foundations.

Research – current programme, key achievements and plans

Uppsala University – Department of Economics

The research in health economics at the department concerns: inequalities in health, health and income, cost-effectiveness and efficiency in health care, the demand for health and medical care and social insurance. A simulation model for costs of stroke care is mentioned as a key achievement. Research areas which will be addressed in the next five years include:

health and income, healthy ageing and retirement, and efficiency in health care resource utilization.

Uppsala University - Department of Pharmacy: Unit of Pharmacoepidemiology and Pharmacoeconomics

The health economic topics addressed in the research programme are: Differences in health related quality of life and health state utilities in the general population. Pain, headache and mental problems as well as gender differences are of special interest.

Methodological studies on the relationship between SF-36, Eq5D, and health state utilities and analyses of HRQoL and health state utilities in the general population are mentioned as key achievements of the health economic research at the unit. The current research will continue during the next five years.

Mälardalen University College

The research group was established 2004/2005 and the key research interests concerns: Health and profitability, health and accounting (health statements as a tool for management control), health management control.

The main research focus is outlined. The plan for the future is to expand the group with senior researchers as well as doctoral students in health economics and other areas. There will be efforts to strengthen the cooperation with other research groups and the unit expects to develop master courses and other courses in the relevant subjects.

Örebro University - Department of Economics, Statistics and Informatics

The health economics research at the department is related to cost benefit analysis (CBA), (value of statistical life, risk assessments) and incentives, in particular design of tax and insurance incentives. Key achievements mentioned are; a) empirical assessment of Value of Statistical Life (VSL), and b) field experimental trials of a "pay-as-you-speed" insurance scheme.

The unit will continue the VSL research and extend it to other health and safety applications and hopes also to be able do a field study on careful-driving incentive system together with an insurance company.

Research – applied contributions and research collaboration

Uppsala University – Department of Economics

The department did not answer this question.

Uppsala University, Department of Pharmacy: Unit of Pharmacoepidemiology and Pharmacoeconomics

There was no answer to the question on applications in health policy. On the question of collaboration the unit mentions that they do work together with Centre for Health Economics at York University in U.K. and that Professor Paul Kind is currently Visiting Professor at the department.

Mälardalen University College

There are expectations from the government to get guidance from the project on health statements in municipalities. Also, the work by Lennart Boggs is significantly policy oriented.

In the end of 2004 a European multidisciplinary group from eight countries was formed. The aim of the group is to create an arena for research in health and profitability, health and accounting, as well as health and management control in public and private organizations. The work is scheduled to continue for three years and will be published in a book.

Örebro University - Department of Economics, Statistics and Informatics

Much of the research has been addressing traffic safety and the department has extensive contacts within the transport policy and traffic safety community in Sweden. There has been some minor collaboration with IHE and the Department of Economics in Lund.

Appendix C - Health economics dissertations 2000-

| University/unit | Name | Sex | Thesis title | Year | Discipline |
|--|----------------------------|-----|---|------|-----------------------------------|
| Lund/LUCHE | Henrik Andersson | M | Willingness to Pay for Reduction in Road Mortality Risk | 2005 | Economics |
| Lund/LUCHE | Klas Bergenheim | M | Essays on Pharmaceutical R&D | 2005 | Economics |
| Lund/LUCHE | Björn Ekman | M | Essays on International Health Economics: The Role of Health Insurance in Health Care Financing in Low- and Middle-Income Countries | 2005 | Economics |
| Lund/LUCHE | Therése Hindman Persson | F | Economic Analysis of Drinking Water and Sanitation in Developing Countries | 2002 | Economics |
| Lund/LUCHE | Catharina Hjortsberg | F | Health Care Utilization in a Developing Country - the Case of Zambia | 2004 | Economics |
| Lund/LUCHE | Petter Lundborg | M | Risky Health Behavior among Adolescents | 2003 | Economics |
| Lund/LUCHE | Mattias Lundbäck | M | Asymmetric Information and the Production of Health | 2000 | Economics |
| Lund/LUCHE | Peter Martinsson | M | Stated Preference Methods and Empirical Analyses of Equity on Health Economics | 2000 | Economics |
| Lund/LUCHE | Lars Nordgren | M | From Patient to Consumer. The Arrival of Market Thinking in Health Care and the Displacement of the Patient's Position | 2003 | Business Administration |
| Lund/LUCHE | Ulf Persson | M | Valuing Reductions in the Risk of Traffic Accidents Based on Empirical Studies in Sweden | 2004 | Economics |
| Lund/LUCHE | Gunnel Ragnarsson Tennvall | F | The Diabetic Foot. Health Economic Aspects, Prevention and Quality of Life | 2001 | Nursing & Business Administration |
| Lund/LUCHE | Klas Rikner | M | Sickness Insurance: Design and Behaviour | 2002 | Economics |
| Lund/LUCHE | Klas Öberg | M | Pharmacy Regulation in Sweden. A New Institutional Economics Perspective | 2003 | Economics & Economic History |
| Stockholm School of Econ. | Erik Grönqvist | M | Selection and Contract Theory - Taking Contract to the Data | 2004 | Economics |
| Stockholm School of Econ. | Mats Ekelund | M | Competition and Innovation in the Swedish Pharmaceutical Market | 2001 | Economics |
| Stockholm School of Econ. | Björn Persson | M | Essays on Altruism and Health Care Markets | 2001 | Economics |
| Stockholm School of Econ. | Ingemar Eckerlund | M | Essays on the Economics of Medical Practice Variations | 2001 | Economics |
| Stockholm School of Econ. | Mattias Ekman | M | Studies in Health Economics - Modelling and Data Analysis of Cost and Survival | 2002 | Managerial Economics |
| Karolinska Institute/Dept Pub health | Hengjin Dong | M | Health Financing Systems & Drug Use in Rural China | 2000 | Public Health |
| Karolinska Institute/Dept of Public Health | Pia Maria Jonson | F | Diabetes Mellitus, Socio- economy and Self-related Health | 2001 | International Health |

Appendix C - Health economics dissertations 2000-

| University/unit | Name | Sex | Thesis title | Year | Discipline |
|---|--------------------|-----|---|------|------------------------|
| Karolinska Institute/Neurotec | Freddie Henriksson | M | Economic Aspects of Chronic Disease: Multiple Sclerosis and Diabetes Mellitus | 2001 | Geriatric Epidemiology |
| Karolinska Institute/ Dept of Public Health | Lennart Bogg | M | Health Care Financing in China: Equity in Transition | 2002 | International Health |
| Karolinska Institute/ Dept of Public Health | Kristina Burström | F | Population Health and Inequalities in Health | 2003 | Social Medicine |
| Karolinska Institute/Neurotec | Linus Jönsson | M | Economic Evaluation of Treatment for Alzheimer's Disease | 2003 | Geriatric Epidemiology |
| Karolinska Institute/Dept of Medicine | Gisela Kobelt | F | Health Economic Assessment of Medical Technology in Chronic Progressive Disease | 2003 | Internal Medicine |
| Karolinska Institute/IMM | Peter Lindgren | M | Modeling the Economics of Prevention | 2005 | Environmental Medicine |
| Karolinska Institute/Dept of Public Health | Jahangir Kahn | M | The Impact of Social Security Compensation Inequality on Earnings Distribution Due to Sickness and Disability | 2005 | Social Medicine |
| Karolinska Institute/LIME | Jonas Lundkvist | M | The Role of Economic Evaluations in Health Care Decision Making | 2005 | Medical Management |
| Linköping/CMT | Lars Bernfordt | M | Setting Priorities in Health Care - Studies on Equity and Efficiency | 2001 | Economics |
| Linköping/CMT | Dick Jonsson | M | Disability, Rehabilitation and Health Economic Assessment | 2001 | Economics |
| Linköping/CMT | Agneta Andersson | F | Economic Studies on Advanced Home Care | 2002 | Economics |
| Linköping/CMT | Karin Sännfält | F | Economic Studies of Health Technology Changes | 2005 | Nursing & Economics |
| Linköping/CMT | Fredrik Jacobsson | M | Den barmhärtige ekonomiten. Effektivitets- och rättvisaspekter på altruism och hälsa | 2005 | Economics |
| Umeå/ Dept of Pub Health | N X Thanh | M | The Injury Poverty Trap in Vietnam - Causes, Consequences and Possible Solutions | 2005 | Medicine |
| Umeå/ Dept of Economics | Niklas Rudholm | M | The Swedish Pharmaceuticals Market - Essays on Equity, Competition and Antibiotic Resistance | 2001 | Economics |
| Uppsala/ Dept of Econ | Patrik Hesselius | M | Sickness Absence and Labour Market Outcomes | 2004 | Economics |
| Göteborg/ Dept of Econ | Daniela Andrén | F | Work, Sickness, Earnings, and Early Exits from the Labour Market | 2001 | Economics |
| Göteborg/ Dept of Econ | Henrik Hammar | M | Essays on Policy Instruments: Applications to Smoking and the Environment | 2001 | Economics |
| Göteborg/ Dept of Econ | Hong Wu | M | Essays on Insurance | 2001 | Economics |

Appendix C - Health economics dissertations 2000-

| University/unit | Name | Sex | Thesis title | Year | Discipline |
|------------------------|--------------------|-----|--|------|------------|
| Göteborg/ Dept of Econ | Thomas Andrén | M | Essays on Training, Welfare and Labour Supply | 2002 | Economics |
| Göteborg/ Dept of Econ | Roger Wahlberg | M | Essays on Discrimination, Welfare and Labour Supply | 2002 | Economics |
| Göteborg/ Dept of Econ | Oleksiy Ivaschenko | M | Essays on Poverty, Income Inequality and Health in Transition Economies | 2003 | Economics |
| Göteborg/ Dept of Econ | Hala Abou-Ali | M | Water and Health in Egypt: An Empirical Analysis | 2003 | Economics |
| Göteborg/ Dept of Econ | Jessica Andersson | M | Welfare, Environment and Tourism in Developing Countries | 2004 | Economics |
| Göteborg/ Dept of Econ | Marcus Eliasson | M | Individual and Family Consequences of Involuntary Job Loss | 2005 | Economics |
| Göteborg/ Dept of Econ | Minhaj Mahmoud | M | Measuring Trust and the Value of Statistical Lives: Evidence from Bangladesh | 2005 | Economics |

Appendix D – Publications submitted

This appendix contains a list of the publications submitted by the research units in the follow-up survey as constituting their *best and most representative* publications during the past five years. The publications are listed in the same order as on the submitted publications lists. “SQ” or “PR” at the end of the publication means that it was indicated as one of the five most important health economics publications from the research unit from the perspective of *scientific quality* and *policy relevance* respectively.

Göteborg university, Department of Economics

Alpizar F, Carlsson F, Martinsson P. Using choice experiments for non-market valuation, *Economic Issues* 2003; 8:83-110. (SQ)

Carlsson F, Johansson-Stenman O, Martinsson P. Is transport safety more valuable in the air? *Journal of Risk and Uncertainty* 2004; 28:147-163. (SQ, PR)

Carlsson F, Martinsson P. Design techniques for stated preference methods in health economics, *Health Economics* 2003; 12:281-294. (SQ)

Hammar H, Johansson-Stenman O. (2004) The value of risk-free cigarettes - Do smokers underestimate the risk? *Health Economics* 2004; 13:59-71. (SQ, PR)

Johansson-Stenman O. Distributional weights in cost benefit analysis – Should we forget about them?” *Land Economics* 2005; 81:335-52. (SQ, PR)

Karolinska institute

(Due to the large number of units reporting together the respondent was asked to submit 10 publications)

Borgström F, Zethraeus N. et al. Costs and quality of life associated with osteoporosis related fractures in Sweden. Accepted in *Osteoporosis International* (SQ.)

Borgström F, Johnell O, Kanis JA, Oden A, Sykes D, Jonsson B. "Cost effectiveness of raloxifene in the treatment of osteoporosis in Sweden: an economic evaluation based on the MORE study." *Pharmacoeconomics* 2004; 22(17): 1153-65. (SQ)

Kobelt G, Andlin-Sobocki P, Brophy S, Jonsson L, Calin A, Braun J. The burden of ankylosing spondylitis and the cost-effectiveness of treatment with infliximab (Remicade(R)). *Rheumatology (Oxford)* 2004; 43:1158-1166. (SQ)

Kobelt G, Andlin-Sobocki P, Maksymowych WP (2005). The cost-effectiveness of infliximab (Remicade) in the treatment of ankylosing spondylitis in Canada. Accepted in *Journal of Rheumatology*. (SQ).

Lundkvist J, Ekman M, Ericsson SR, Isacson U, Jonsson B, Glimelius B. Economic evaluation of proton radiation therapy in the treatment of breast cancer. *Radiother Oncol*, 2005; 75: 179-85. (SQ)

Burström K, Johannesson M, Diderichsen F. The value of the change in health in Sweden 1980/81 to 1996/97. *Health Economics* 2003; 12(8):637-654. (SQ)

Burström K, Johannesson M, Diderichsen F. Increasing socio-economic inequalities in life expectancy and QALYs in Sweden 1980 to 1997. *Health Economics* 2005; 14(8):831-850. (SQ)

Khan J, Gerdtham UG, Jansson B. Effects of macroeconomic trends on social security spending due to sickness and disability. *American Journal of Public Health* 2004; 94(11):2004-9. (SQ, PR)

Lundkvist J, Jönsson B, Rehnberg C. Cost-effectiveness of new drugs – a systematic review of published evidence for NCE drugs introduced on the Swedish market 1987-2000. *Int J Tech Assessment in Health Care*, 2005; 21(2):187-193. (PR)

Meng Q, Rehnberg C. et al. The impact of urban health insurance reform on hospital charges: a case study from two cities in China. *Health Policy*. 2004; 68(2):197-209.

Karolinska institute, Neurotec: Aging Research Center (ARC)

Wimo A, Winblad B, Engedal K, Soininen H, Verhey F, Waldemar G, Wetterholm AL, Mastey V, Haglund A, Zhang R, Miceli R, Chin W, Subbiah P. An economic evaluation of Donepezil in mild to moderate Alzheimer's disease: Results of a one-year, double-blind, randomized trial. *Dement Geriatr Cogn Disord*. 2003;15(1):44-54. Erratum in: *Dement Geriatr Cogn Disord*. 2003;16(2):102. (SQ, PR)

Wimo A, Winblad B, Stöffler A, Wirth Y, Möbius HJ. Resource utilization and cost analysis of Memantine in patients with moderate to severe Alzheimer's disease. *Pharmacoeconomics* 2003;21(5):327-40. (SQ)

Wimo A. Cost effectiveness of cholinesterase inhibitors in the treatment of Alzheimer's disease : a review with methodological considerations. *Drugs Aging* 2004; 21(5):279-95. (PR)

Nordberg G, von Strauss E, Kåreholt I, Johansson L, Wimo A. The amount of informal and formal care among non-demented and demented elderly persons – results from a Swedish population based study. *Int J Geriatr Psychiatry* 2005; 20:862-71. (SQ,PR)

Jönsson L. Cost-effectiveness of Memantine for treatment of moderately severe to severe Alzheimer's disease in Sweden. *Am J Geriatric Pharmacotherapy* 2005; 3:77-86. (SQ)

Linköping university, Center for Medical Technology Assessment (CMT)

Carlsson P. Health technology assessment and priority setting for health policy in Sweden. *Int J Health Tech Assess in Health Care*, 2004; 20, 44-54.

Henriksson M, Lundgren F. Decision analytical model with life-time estimation of costs and health outcomes for one-time screening for abdominal aortic aneurysm in 65-year-old men. *British Journal of Surgery* 2005; 92:976-983. (SQ)

Janzon J, Levin LÅ, Swahn E. Long-term cost-effectiveness of invasive strategy in patients with unstable coronary artery disease- Results from FRISC II invasive trial (submitted for publication). (SQ PR)

Levin LÅ, Bergqvist D. Cost effectiveness of Desirudin compared with a low molecular weight Heparin in the prevention of deep vein thrombosis after total hip replacement Surgery. *Pharmacoeconomics* 2001; 19(5 Pt 2): 589-597. (PR)

Sennfält K, Carlsson P, Sandblom G, Varenhorst E. The estimated economic value of the welfare loss due to prostate cancer pain in a defined population. *Acta Oncologica* 2004; 43:290-296. (SQ)

Lund university, Dept of Health, Care and Society; Dept. of Economics; LUCHE

Blomberg S, Edebalk PG, Petersson J. The withdrawal of the welfare state - elderly care in Sweden in the 1990s. *European Journal of Social Work* 2000;3:151-163. (SQ)

Bolin K, Jacobson L, Lindgren B. Employer investments in employee health – Implications for the family as health producer. *Journal of Health Economics* 2002;21:563-583. (SQ)

Carlsson F, Martinsson P. Design techniques for stated preference methods in health economics. *Health Economics* 2003;12:281-294. (SQ)

Lindbladh E, Lyttkens CH. Habit versus choice: the process of decision-making in health-related behaviour. *Social Science & Medicine* 2001;55:452-465. (SQ)

Lundborg P. Having the wrong friends? Peer effects in adolescent substance use. *Journal of Health Economics* 2005 (In press). (SQ)

Lund university, Dept of Clinical Sciences; Section for Psychiatry, Primary Care and Public Health

Gerdtham UG, Löthgren M. On stationarity and cointegration of international health expenditure and GDP. *Journal of Health Economics* 2000; 19: 461-475.

Gerdtham UG, Johannesson M. Income-related inequality in life-years and quality-adjusted life-years in Sweden. *Journal of Health Economics* 2000; 19: 1007-1026. (SQ)

Gerdtham UG, Johannesson M. Do life-saving regulations save lives? *Journal of Risk and Uncertainty* 2002; 24: 231-249. (SQ)

Gerdtham UG, Johannesson M. Absolute income, relative income, income inequality and mortality? *Journal of Human Resources* 2004; 39: 228-247. (SQ)

Gerdtham UG, Lundin D, Saez-Marti M. The ageing of society, health services provision and taxes. *Journal of Population Economics*. In press. (SQ)

Stockholm School of Economics, Centre for Health Economics (CHE)

Jönsson B. Economics of drug treatment: for which patients is it cost effective to lower cholesterol? *Lancet* 2001; 358:1251-56 (PR)

Bleichrodt H, Johannesson M. Time preference for health: a test of stationarity versus decreasing timing aversion. *Journal of Mathematical Psychology* 2001; 45:265-282. (SQ)

Gerdtham UG, Johannesson M. Absolute income, relative income, income inequality and mortality. *Journal of Human Resources* 2004; 39:228-247. (SQ)

Jacobsson F, Johannesson M, Borgquist L. Is altruism paternalistic? Revised and resubmitted to *Economic Journal*. (SQ, PR)

Ekelund M, Persson B. Pharmaceutical pricing in a regulated market. *Review of Economics and Statistics* 2003; 85:298-306. (SQ)

Umeå university, Department of Economics

Granlund D, Rudholm N, Wikström M. Fixed budgets as a cost containment measure for pharmaceuticals. Forthcoming in *European Journal of Health Economics* 2004. (PR)

Rudholm N. Economic implications of antibiotic resistance in a global economy. *Journal of Health Economics* 2002; 21:1071-1083. (SQ, PR)

Aronsson T, Thunström L. Optimal paternalism: Sin taxes and health subsidies. *Umeå Economic Studies* 2005; 662. (SQ)

Granlund D. Sickness absence and health care in an economic federation. Mimeo, *Umeå Economic Studies* 2005; 665. (SQ,PR)

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Appendix E – Interviews

Evaluation of Swedish health economics research

Date: Monday, December 12, 2005

Place: FAS, Birger Jarls torg 5, Room: Gråmunken

Interviews with policy makers and administrators – Participants

Group 1 (13.00-15.00)

Irene Nilsson-Carlsson, Director, Public Health Division

Anders Ekholm, Director, Analysis and Evaluation Unit

Swedish Ministry of Health and Social Affairs

Stefan Ackerby, Deputy Director, Finances and Governance Division

Swedish Association of Local Authorities and Regions

Johan Calltorp, Professor, Waiting-time guarantee project leader,

Knowledge management investigator, commissioned by the

Swedish Association of Local Authorities and Regions

Ingvar Wiberg, Director of Research

Regional Government of Skåne

Göran Henriksson, Public Health Advisor

Regional Government of Västra Götaland

Group 2 (15.00-17.00)

Fredrik Berggren, Medical Guidelines and Priorities Unit

Swedish National Board of Health and Welfare

Bernt Lundgren, Director of Public Health Policy Analysis

National Institute of Public Health

Anders Norlund, Project Leader

Swedish Council on Technology Assessment in Health Care

Edward Palmer, Director of Research and Development

Swedish Social Insurance Agency

Douglas Lundin, Health Economist

Pharmaceutical Benefits Board

Evaluation of Swedish health economics research

Date: Tuesday December 13, 2005

Place: FAS, Birger Jarls torg 5, Room: Gråmunken

Interviews with researchers - Participants

Group 1 (8.30-10.00)

Bengt Jönsson, Professor, Dept of Economics, Stockholm School of Economics

Clas Rehnberg, Assoc Professor of Health Economics, Dept of Learning, Informatics, Management and Ethics, Karolinska Institute, Stockholm

Kristina Burström, Dept of Social Medicine and Epidemiology, Stockholm Centre for Public Health

Group 2 (10.30-12.00)

Björn Lindgren, Professor of Health Economics, Lund University Centre for Health Economics

Carl Hampus Lyttkens, Professor of Economics, Dept of Economics, Lund University

Anders Anell, Assoc Professor, Research Director, Institute of Health Economics, Lund

Group 3 (13.00-14.30)

Lars Lindholm, Assoc Professor, Dept of Public Health, Umeå University

Niklas Rudholm, Ph.D, Dept of Economics, Umeå University

Lennart Flood, Professor, Dept of Economics, Göteborg University

Group 4 (15.00-16.30)

Per Carlsson, Professor, Assistant Director, Centre for Medical Technology Assessment

Lars-Åke Levin, Associate Professor, Centre for Medical Technology Assessment, Linköping University

Gun Sundberg, Associate Professor, Dept of Economics, Uppsala University

Lennart Bogg, Senior Lecturer, School of Business, Mälardalen University College



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