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Health inequalities in Finland

TRENDS IN SOCIOECONOMIC HEALTH DIFFERENCES 1980-2005

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Abstract

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This report encompasses health inequalities between socioeconomic groups over the last 25 years in Finland. The data cover time trends in socioeconomic differences in mortality, self-rated health, morbidity, functional capacity, mental health, healthy life expectancy, health behaviours and biological risk factors as well as disparities in the use of health services. Results from earlier studies have been supplemented with unpublished data and new analyses specifically done for this report. The report starts with a review on the causes and explanatory models of health inequalities. After describing the time trends in health inequalities and their determinants, health and social policy measures tackling health inequalities are discussed. The main indicator of socioeconomic position in this report is education, but social class based on occupation, as well as income and employment status are also used. Information on the working-aged population is most extensive but also children, adolescents and the elderly have been covered when possible.

Various indicators show that the health of the Finnish population has improved but socioeconomic health inequalities have generally remained or even widened. It appears increasingly difficult to reach the Health 2015 Public Health Programme goals for reducing differences in mortality by a fifth by 2015. Long-term illnesses are about 50% more common among the lowest educational and other socioeconomic groups than in the highest groups. These differences have slightly decreased among the working-aged but increased among those aged 65 or over. Differences in self-rated health have remained clear during the study period. Differences in functional capacity and self-reported work ability have also remained quite stable over the past two decades. Information on trends in mental health problems by population groups is scarce, but severe mental disorders continue to be more common in the lower socioeconomic groups. Healthy life expectancy varies according to education even more strongly than life expectancy.

Health related behaviours show large socioeconomic differences especially among the working-aged, whereas differences in health behaviours among the retired are smaller. Socioeconomic differences in smoking in the working-aged population have widened. Heavy alcohol use and binge drinking are more common in the lower socioeconomic groups. The proportion of adolescents

who smoke and get drunk is much higher among students in vocational schools than among students in high schools. Persons in higher socioeconomic groups follow dietary recommendations more often than those in lower socioeconomic groups, although differences in fat and vegetable use have decreased. Physical activity among the working-aged men has continuously been the most common in the highest socioeconomic groups. Socioeconomic differences in biological risk factors, such as high blood pressure, serum cholesterol and obesity, have remained large.

There are socioeconomic differences in the use of health services that do not fully correspond to the estimated need for care. When need for care is taken into account, people with high income use more occupational health and private practice services than those with lower income. Visits to municipal health centres, however, are more common among those with low income. There are similar differences in the use of dental services, although these have diminished along with dental care system reforms. Little is known about the differences in the use of mental outpatient care by population groups. Hospital treatment for severe diseases also varies: bypass surgery and angioplasty of coronary arteries, endoprosthesis surgery of knee and hip, and cataract surgery are more frequent in those with high income than those with low income after considering the need for care. The increase in coronary artery procedures in the 1990s levelled out but did not abolish the socioeconomic inequalities.

Reducing health inequalities has been an objective in the Finnish health policy programmes since 1986. In recent years, health inequalities have been increasingly viewed as larger socio-political problems than just a problem of traditional health policy (e.g. in the Government Programmes of 2003 and 2007). However, the evidence on the tools that work in reducing health inequalities is limited. Health impact assessment of political and social measures, required by the Health 2015 public health programme, is only in its first stages and the development of methods for this assessment is on the way. Finnish research on health inequalities, based on population surveys and registers, is of high quality but scattered, and in need of better co-ordination. Furthermore, it is vital to establish a monitoring system that would serve planning and implementation of health policies and assessment of their goal attainment. Policies should incorporate measures that aim to even out social inequalities, as well as measures that strengthen the prerequisites for a healthy life and facilitate the adoption of healthy lifestyles so that lower socioeconomic groups will approach the levels acquired by the higher groups. The needs of the lower socioeconomic groups should be addressed in all health and welfare policies including planning and provision of services.

Keywords: health, health policy inequity, social status

Foreword

People in Finland are living longer than ever before, and many other indicators likewise suggest that the health of the population is improving. However, as is shown in this report, there still remain marked differences between socio-economic groups in life expectancy, morbidity, and disease risk factors. Furthermore, it seems that inequalities are exacerbated by certain structural aspects of health services and the way those services are targeted and allocated. The most worrying thing of all is that socio-economic differences in mortality have not diminished.

The overriding objective of the national Health 2015 programme that was adopted in 2001 in Finland is to reduce health inequalities between different population groups. One of the key ways of achieving this, according to the programme, is to improve the well-being and relative position of the most underprivileged population groups. Indeed the reasons for health inequalities lie partly in broader social factors and in the general conditions for well-being. In addition, health inequalities are increased by socio-demographic differences in the risk factors for major public health diseases. The challenge of reducing health inequalities will therefore require a wide range of actions to safeguard health and well-being, and close cooperation between administrative sectors at different levels.

The goal of reducing health inequalities is explicitly mentioned in both the 2003 and 2007 Finnish Government Programmes. The 2006 Social and Health Report to the Parliament also identified the reduction of health inequalities and the prevention of marginalisation as key challenges for the future. In its strategy document for social and health policies (Strategies for Social Protection 2015), the Ministry of Social Affairs and Health identifies the reduction of health inequalities as a major target in the promotion of the population's health and functional capacity. This document recommended that a broadly-based national action plan for the reduction of health inequalities be set up. Such a programme was recently prepared under the auspices of the Advisory Board for Public Health at the Ministry of Social Affairs and Health and the programme is now at the stage of implementation. Ways of reducing socio-economic inequalities also figure prominently in many other ongoing development projects and current programmes, such as the Government's policy programme for health promotion.

Careful research and a sound information base are paramount to monitoring changes in health inequalities. This report provides a varied and diverse overview of how socio-economic health inequalities and underlying factors have changed over the past 20 years and sets a useful benchmark for future studies to regularly monitor those inequalities.

Paula Risikko
Minister of Health and Social Services

Editors' Preface

There is a large body of research on health inequalities in Finland which draws on high-quality and comprehensive registers and on major population health surveys. Much of this work has been done by individual researchers and research teams with separate funding sources. However for purposes of coherent health policy planning as well as for assessing and monitoring policy targets, it is necessary to have an established information system and regular reporting mechanisms. Health Inequalities in Finland is intended as a baseline report that will serve as a benchmark for assessing changes in socio-economic health inequalities in Finland at approximately four-year intervals.

This report has been compiled as part of the TEROKA project (www.teroka.fi) for the reduction of socio-economic health inequalities in Finland. It provides a comprehensive overview of trends in socio-economic health inequalities in Finland over the past quarter of a century. The report is based on existing research, but it also contains many new analyses.

This report was made possible by project funding from the Ministry of Social Affairs and Health and by support in the form of both funding and expertise from the National Public Health Institute KTL, the National Research and Development Centre for Welfare and Health STAKES, the Finnish Institute of Occupational Health and the University of Helsinki.

The report was originally published in Finnish (Publications of the Ministry of Social Affairs and Health 2007:23). This English language version of the report provides readers from other countries with an overview of how health inequalities and associated factors have evolved in Finland over the past few decades. Our report is a national complement to the recent publication by the WHO Social Determinants of Health Commission and supports its recommendations with respect to reducing health inequalities within and between different countries.[1]

Helsinki, 10 October 2008
Editors

[1] Closing the gap in a generation. Health equity through action on the social determinants of health. http://www.who.int/social_determinants/en/

Contents

1 HEALTH INEQUALITIES AND THE CHALLENGE OF HOW TO REDUCE THEM

Ritva Prättälä, Seppo Koskinen, Tuija Martelin, Eero Lahelma, Marita Sihto and Hannele Palosuo

Health inequalities between population groups have long presented a severe challenge to egalitarian health and social policy. The health of individuals and groups is influenced by their position in the social structure: there are marked health inequalities between socio-economic groups. People with a high level of education, high income and high occupational position, on average, live longer and have a healthier life than others. This report focuses on describing socio-economic health inequalities and their development over the past few decades in Finland.

Health inequalities have received intense research interest both in Finland and elsewhere. The first wave of research started in the mid-19th century (Karisto 1981, Pitkänen 1988). More than one hundred years on, the publication of the Black Report in the UK (Townsend and Davidson 1982) sparked a new wave of research that is still ongoing (Rahkonen and Lahelma 2005). Research into health inequalities has continued to proliferate in the last couple of decades: studies on the size of health inequalities, their causes and patterns of change have been published both in Finland (see Manderbacka et al. 2000, Kangas et al. 2002) and in other countries (see Mackenbach et al. 2003, Palosuo et al. 2004, Mackenbach et al. 2005, Kunst et al. 2005, Mackenbach et al. 2008).

In order to reduce these unfair socio-economic health inequalities, it is necessary to know how and why they have developed and which population groups are at a particular disadvantage. Finnish research on health and health inequalities has the benefit of being able to draw on systematic statistical and other national data sources of exceptionally high standard. However, the research effort has largely been organised around individual projects by individual researchers and research teams: there has been no systematic process to monitor the development of health inequalities, which has obviously made it harder to piece together a bigger picture. As for the challenge of how to reduce health inequalities, a major hindrance is the paucity of information about the means and ways in which they can be tackled (Kangas et al. 2002, Palosuo et al. 2004).

This report is based, firstly, on research results that have accumulated over the past few decades on mortality and morbidity differences in Finland (e.g.

Valkonen et al. 1990, Lahelma et al. 1993); and secondly, on the objectives set out in official health policy documents for the reduction of socio-economic health inequalities (Government Resolution on The Health 2015 Public Health Programme, MSAH 2001), as well as on some progress reports published in the past ten years (Koskinen and Teperi 1999, Kangas et al. 2002, Keskimäki et al. 2002, Palosuo et al. 2004). The purpose of these reports has been to inspire discussion and debate among Finnish experts and decision-makers on how the goal of narrowing health inequalities in the population can be achieved. The main focus has been on ways of reducing the inequalities by means of health and social policy as well as through the service system. Other areas addressed include the impact on health inequalities of lifestyles, marginalisation and poverty, the formative years of childhood and adolescence, and problems experienced in working age. Furthermore, the tools available for reducing health inequalities and improving the well-being and relative position of the most underprivileged groups have been assessed by reference to the experience in other countries.

The conclusion drawn in these earlier reviews has been that health inequalities cannot be reduced by means of general health promotion activities alone. Apart from knowledge about the extent of health inequalities and the direction in which they are developing, evidence is also needed on effective policies, strategies and actions.

This report on *Health Inequalities in Finland* fills in some of the gaps in existing knowledge by bringing together earlier Finnish studies on socio-economic health inequalities and their evidence on how these inequalities have changed over the past 25 years. It uses both published and unpublished data and reviews on actions to reduce socio-economic health inequalities and related factors. The studies quoted are based on a wide range of different datasets. Some of the data have been specially compiled and analysed for this report. The most important sources include register data on mortality and socio-economic position, hospital discharge registers, as well as data from regular population health surveys on morbidity, functional capacity, self-rated health, and lifestyles. These sources are listed in the Appendix. The main emphasis in the report is on the population of working age, which is at once the age group that has received the most research attention. Where possible, these descriptions are complemented with results for children, adolescents and the elderly. Socio-economic position is a complex and multifaceted concept, and the one dimension that is most in the spotlight here is education. Where relevant data are available, health status and the determinants of health are also examined according to occupational class and level of income.

One of the objectives in compiling this report has been to set a benchmark for future studies: the purpose is to monitor health inequalities now on a regular basis at about four-year intervals, to see how these inequalities have developed, how the efforts to reduce those inequalities have succeeded, and what has happened to the underlying background factors. These regular follow-ups of health inequalities and their causes should provide a valuable health policy tool and knowledge resource for the ongoing effort to narrow health inequalities.

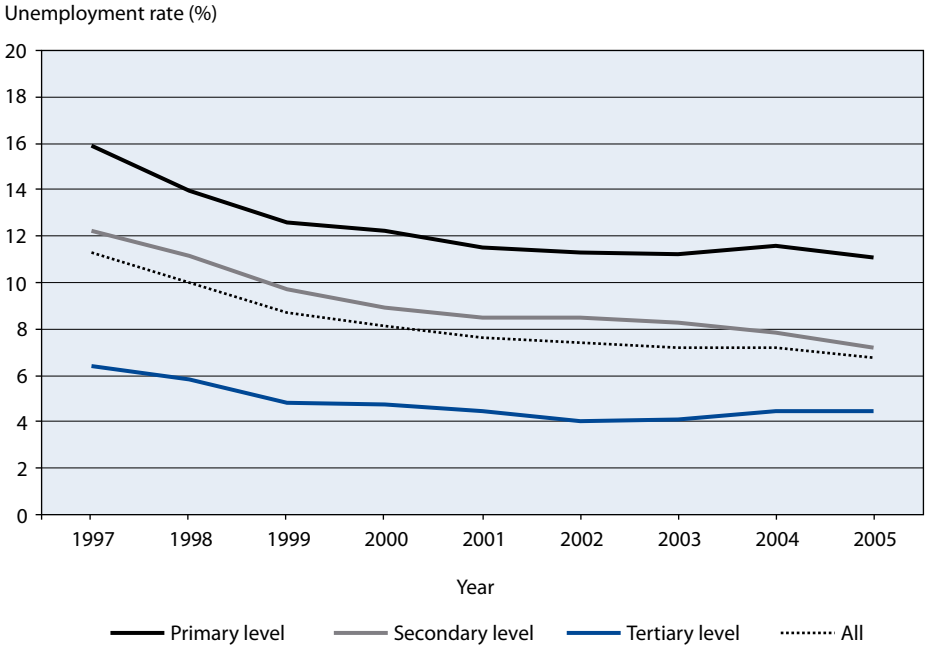
Factors lying behind health inequalities

Over the past 25 years, the period that is covered by this report, there have been many changes in Finnish society that have had an impact on health inequalities. In the early 1990s, following a sustained period of strong growth, the economy plummeted into recession. Unemployment immediately took off and soared to 17 per cent by 1994 (Statistical Yearbook of Finland 2006). Since then the unemployment rate has steadily fallen back to five per cent in August 2008, (Statistics Finland 2008), but it still remains higher than before the recession. Youth unemployment has been particularly high: around one-fifth of the population aged 15–24 in the labour force were out of work in the early 2000s, in 2007 the figure was 16 per cent (Labour Force Statistics 2007), compared to an average of around 10 per cent in the 1980s (Statistical Yearbook of Finland 2006). Different educational groups are affected in different ways: in the early 2000s the unemployment rate among people with no more than primary education was more than twice as high as among those with a tertiary education (Figure 1).

The country pulled out of recession in the mid-1990s and entered a new upward cycle that has continued in the 2000s. However, the benefits derived from the growth of the national economy have been less than evenly distributed. Income inequalities started to increase sharply after comparative stability since the 1980s (Figure 2). This trend continued until the early 2000s. Since then, income inequalities have remained at the same level as in the early 1970s.

In spite of the economic upturn, the proportion of low-income people has steadily risen since the mid-1990s (Statistics Finland: Income distribution statistics). In particular, the number of poor families with children increased sharply in the 1990s (Sauli et al. 2004, Moisio 2006). At the same time, there has been a marked increase in the number of children and young people taken into care (Statistical Yearbook of Finland 2006). Many decisions concerning social policy taken during and after the recession have had the effect of lower-

Figure 1. Unemployment rate[1] in the population over 25 by education in 1997–2005



[1]Unemployed as a proportion of the labour force; figures are age-adjusted to the labour force in 2005.

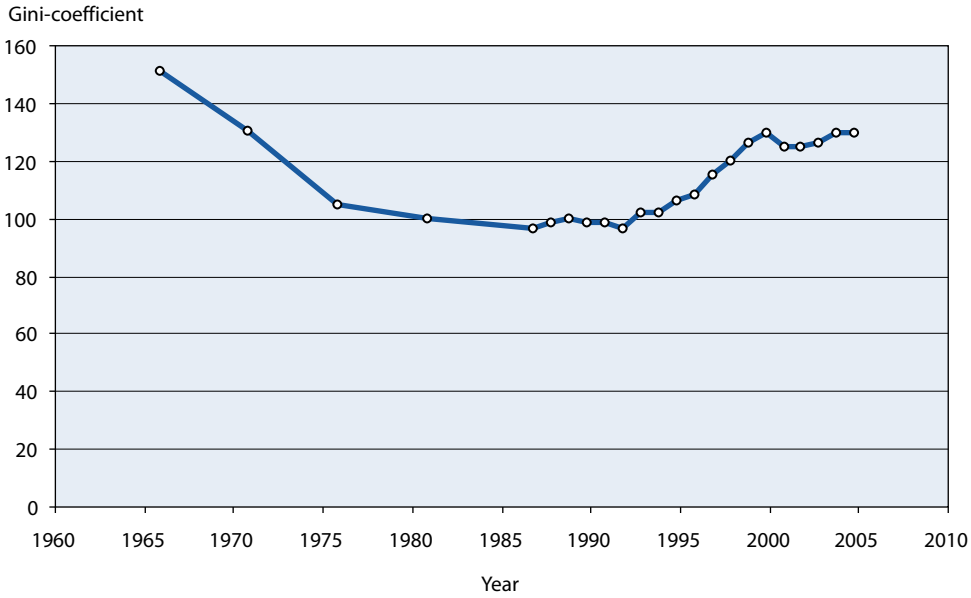
Sources: Labour force: educational level and occupation 1997–2003, Statistics Finland;
Labour force: educational level and occupation 2000–2005, Statistics Finland

ing the standard of social security and undermining the relative position of the most underprivileged groups (Kautto and Uusitalo 2004). One particularly noteworthy political decision that has affected the lifestyles and health of people in Finland was the move to cut alcohol taxes substantially in 2004, which was immediately reflected in alcohol consumption and the occurrence of alcohol problems, including alcohol-related deaths (Statistics Finland: Alcohol mortality in 1998–2005).

These economic changes have taken place against the backdrop of major social and political upheavals across Europe, including the collapse of the Soviet Union and EU enlargement. The changes that have swept Finnish society have affected people's living conditions and particularly their situation in the world of work (Karvonen et al. 2006). Some of these changes may also have contributed to increasing socio-economic inequalities in health.

Living conditions and associated cultural factors have a diverse and complex impact on people's health as well as on the lifestyles and biological risk factors that shape their health. Living conditions are not, however, given sepa-

Figure 2. Income inequalities in Finland in 1966–2005 (disposable income per consumption unit; relative Gini coefficient, year 1981=100).



Source: Statistics Finland: Income distribution statistics

rate treatment in this report, but their impact is considered as an underlying factor in each phenomenon discussed. In addition to improving people's living and working conditions, health inequalities can also be addressed by introducing policy measures aimed at influencing people's lifestyles and reducing their exposure to biological risk factors, and by developing health and other services in such a way that they better correspond to the needs of different population groups.

Health inequalities can be reduced

Reducing socio-economic health inequalities has been a major health policy goal for many decades (e.g. Koskinen and Teperi 1999, Keskimäki et al. 2002, Marmot 2005, WHO 2008). According to the Health 2015 public health programme (MSAH 2001), the master document of current national health policy, all efforts at health promotion and at developing health care services should be informed by the goal of reducing health inequalities and improving the well-being and relative position of the most underprivileged groups. The first Finnish National Action Plan to reduce health inequalities (MSAH 2008) emphasises the need to address social determinants of health and the processes behind the inequalities by means of persistent multisectoral work.

Attempts to reduce regional health inequalities have been ongoing for at least half a century in Finland (Kannisto 1947, Kuusi 1961). Key measures have included the establishment of child welfare clinics, a network of central hospitals and sickness insurance system, and the introduction of the Primary Health Care Act, initially in areas with the most acute health problems. Indeed, much progress has been made in narrowing regional health inequalities (Pitkänen et al. 2000, Vartiainen et al. 2003, Martelin et al. 2002 and 2005). Another long-standing goal has been to reduce gender health inequalities, particularly the excess mortality of men (Kannisto 1951, Kuusi 1961). In recent years the gender difference in life expectancy has decreased somewhat (Martelin et al. 2005).

It is important to consider why we have been successful in reducing health inequalities between regions and genders, but socio-economic differences have remained unchanged or even increased. At least part of the explanation may lie in the data produced by health monitor surveys. In virtually all statistics and reports on public health, the results have long been presented by gender and place of residence. Regional and gender health inequalities were previously also in the focus of health policy measures. Health data for different educational, occupational or income groups were scarce, and even the experts neglected to pay sufficient attention to socio-economic health inequalities. Perhaps the scarcity of data on health inequalities in earlier national health reports is also explained by a lack of interest in what is an inherently difficult topic. One possible reason for this lack of interest may lie in the absence of effective means to reduce health inequalities. In order that the problems can be identified and steps be taken to tackle those problems, it is necessary to have up-to-date information on the prevalence of different health problems and on how they have changed in major population groups. For purposes of assessing the effectiveness of the measures taken, it is necessary to have ongoing monitoring mechanisms in place.

Structure of the report

The report begins with a summary of what is already known about the causes of socio-economic health inequalities in the light of earlier research. This is followed by descriptions of socio-economic differences in mortality, self-rated health, mental health problems, other long-term morbidity and functional capacity, and of how these differences have changed over time. It is concluded with a summary presentation on mortality and health in terms of healthy life years by socio-economic position. Following this part, we move on to consider the underlying factors that have significantly influenced health in different

socio-economic groups. The main focus is on so-called proximal factors, i.e. background factors that are causally most closely associated with health and health inequalities, such as lifestyles and biological risk factors that have significant public health implications. A separate chapter is devoted to differences in the availability and use of health services and to differences in treatment and care. Distal structural factors and inequality in living conditions, both of which impact on the health of individuals and groups, are another potential source of health inequalities, but this report does not address these associations directly.

Finally, the report concludes with an overview of the policy of reducing socio-economic health inequalities during the past two decades, a summary as well as our conclusions on the development, causes and reduction of health inequalities.

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2 SOCIO-ECONOMIC HEALTH INEQUALITIES: CAUSES AND EXPLANATORY MODELS

Eero Lahelma, Ossi Rahkonen, Seppo Koskinen, Tuija Martelin and Hannele Palosuo

Introduction

Health is an important resource and necessary condition for many other components of well-being and for a good life in general (Allardt 1976 and 1999). The population's average health and health differences between population groups are therefore key indicators in assessing the preconditions for a good life, the population's well-being and the success of the welfare state (Lundberg and Lahelma 2001).

Socio-economic differences in health, morbidity and mortality are a fundamental manifestation of social inequality. There are significant health inequalities between other major population groups as well, such as men and women, marital status groups and ethnic groups, but the focus in this report is on differences between socio-economic groups. To better understand health inequalities and how they are produced and reproduced, we need to establish their underlying causes and reasons. This knowledge is also important for health and welfare policymakers and their efforts to reduce health inequalities.

Health status and life expectancy have improved in the Finnish population as a whole, but these improvements have not been equally distributed between socio-economic groups. Not just in Finland but elsewhere, health is closely linked to social position: people in lower social positions have poorer health and shorter lives than those in the higher echelons of the social hierarchy. These differences have not been reduced in recent decades, either in Finland (see Chapter 3 in this report) or in other countries (Lahelma et al. 2002, Kunst et al. 2005). Socio-economic morbidity differences have remained more or less unchanged and socio-economic mortality differences have actually widened. Compared to other European countries, mortality differences in Finland are traditionally large (Mackenbach et al. 2003, 2008), but they have still continued to increase until very recently (see section 3.1 in this report).

There is an abundance of descriptive data on socio-economic differences in health and mortality. Some information is also available on how these changes

have developed and on country differences. By contrast our knowledge of the underlying causes of health inequalities remains patchy. Health is not a direct function of social position, but health inequalities come about as a result of exposure at different stages of the life cycle to different living conditions, lifestyles and other background factors that are primarily linked to the unequal distribution of resources.

In an attempt to unearth the causes of socio-economic health inequalities, researchers have both developed broader explanatory models and to some extent even explored individual underlying factors. In the discussion below, we look at some of the major explanatory models that aim to identify the key factors and clusters of factors behind health inequalities and to establish the direction of causation and possible feedbacks. We consider how well the models have worked in practical research and sum up their evidence on the most important causes of health inequalities.

The nature of socio-economic health inequalities

Socio-economic health inequalities are deeply entrenched in the structures of modern society. The structures and processes that inherently engender social and other inequalities are reflected in the totality of people's social position. These inequality-engendering processes are manifested in the unequal distribution of power, esteem, wealth and other resources in society.

Health inequalities thus reflect the hierarchic construction and order of society as a whole, and they show on all dimensions of the individual's social position. Key among these dimensions are education, labour market position, occupational social class, and income and wealth. An important factor is education, which is acquired in youth and rarely changes very much during the individual's life span – although this may well change in the future with the growing pressures of lifelong learning. Education, then, influences both labour market and occupational position, which attach the individual to central structures of society that are determined by gainful employment. Together with education, these then determine the individual's income and financial status. Occupation and income in particular can vary considerably during the individual's employment career.

The various dimensions of socio-economic position are closely interwoven with one another, but each dimension is also directly and independently linked to health (Martelin 1994, Lahelma et al. 2004, Laaksonen et al. 2005a). Education produces certain skills and knowledge, occupational status in turn reflects working conditions. Income determines material conditions and capacity for

consumption. In other words, there is no single "best" indicator of social position. The relative importance of different dimensions may also vary at different times and in different countries. For example, income differentials in Finland are smaller than in many other countries, and health inequalities between income groups are less pronounced than those between educational groups (Cavelaars et al. 1998). As was pointed out above, health is also determined by many other factors such as gender, age, ethnic background and family status, which may impact the steepness of socio-economic health inequalities.

Health may be differentially graded or patterned by social position depending on the dimensions of social position and health concerned. Firstly, the association between health and social position may be linear, i.e. the lower the social position group, the poorer the person's health. One example of such a linear association is that between education and mortality. According to international comparisons by Valkonen (1989), mortality decreases by 8–9 per cent with each extra year of education. Secondly, the association between health and social position may be curvilinear so that an increase in income, for example, has a greater impact on health in lower than higher income groups (Mackenbach et al. 2005). Thirdly, it is sometimes possible to detect a specific threshold value below which health is poorer and above which health is better than in others. Poverty, long-term unemployment or other marginalisation may create a clear health divide, with the long-term unemployed, for example, being in much poorer health than the temporarily unemployed and the employed population (Najman 1993).

Socio-economic groups cannot always be placed in a strict hierarchic order, but their ranking may be partly ordinal and partly nominal, i.e. based on differences in quality. This is true of Statistics Finland's classification of socio-economic position, for instance, where it is impossible to establish the hierarchic position of farmers and other entrepreneurs vis-à-vis blue-collar and white-collar employees.

Studies into socio-economic health inequalities usually cover the whole spectrum of social positions from lowest to highest, including all intermediate groups. These studies have generally not reported any clear threshold values. The main trend observed is that health is poorer in lower social position groups.

An important distinction that must be made when discussing the nature of health inequalities and the challenge of how to reduce them, is that between relative and absolute inequalities (Lundberg and Lahelma 2001). Most research is concerned with relative inequalities. Typically in this instance, the health of various groups is compared with a reference group that has the best health or

that represents the highest socio-economic position, using some ratio method. The results will show, for example, the ratio of morbidity rates in blue-collar workers compared to upper white-collar employees. Absolute inequalities, then, provide a measure of the numerical difference in, say, the number of blue-collar and white-collar employees suffering from a certain illness. Life expectancy, i.e. the average number of years of life remaining, is another measure of absolute inequalities between different population groups. Both absolute and relative inequalities can be expressed by a variety of different indices, including various inequality indices (Mackenbach and Kunst 1997).

If we want to find out why blue-collar workers are less healthy than white-collar employees, for instance, our search for the causes must focus on relative inequalities. For purposes of health policy and the promotion of health equality, however, an examination of relative inequalities is not enough, for the goal of health policy is precisely to reduce absolute health inequalities. Even a major improvement in the health of a numerically small socio-economic group will have little effect on health inequality at the population level. By contrast even a minor improvement in the health of a large underprivileged group will narrow health inequalities and improve the health of the whole population.

The main focus in the promotion of health equality is on preventable health inequalities, many of which are due to living conditions and lifestyle factors. All health inequalities that are in principle preventable can be considered unfair and unjust in a welfare state, the declared aim of which is to ensure the equality of its citizens and population groups. Understood in these terms, inequality in health, illness and death presents a challenge both for research aimed at unlocking the causes of inequalities and for health and social policy that is geared to ensuring well-being and equality in the population (Mackenbach et al. 2003, 2008). Research and egalitarian health policy are closely related to each other in the sense that the identification of the causes of health inequalities will help social and health policy target those factors that are the most crucial to preventing and reducing the inequalities.

Explanatory models

Explanatory models cluster together the major structural causes of socio-economic health inequalities and demonstrate the direction and nature of causal links. The explanatory models of health inequalities first received wider attention with the publication of the Black Report in the UK in the early 1980s (Townsend and Davidson 1982). In fact as early as the nineteenth century, the causes of health inequalities and mortality differences had attracted some

discussion in the UK and Finland (Lahelma et al. 1996), and the first efforts to systematise the differences date back to the 1920s (Macintyre 1997). The Black Report outlined a framework which organised into clusters the most important ways of explaining health inequalities and which assessed the links of these models with empirical research. The models identified by Townsend and Davidson continue to inform the discussion on the causes and explanations of health inequalities as well as the research that aims to offer such explanations. The models are briefly described below: they are the artefact explanation, natural or social selection, the cultural and health behaviour explanation, and materialist and structural explanations.

Artefact explanation

The artefact explanation rests on the idea that the association observed between social position and health is artificial, that in reality there is no association. The inequalities observed are due to inadequate measurements of social position and/or health status, or to inaccuracies in the measurement of associations between social position and health. A major reason for these inaccuracies is thought to lie in what is referred to as the 'numerator-denominator bias': this happens when, for instance, occupational data for deceased persons (the numerator) are collected from death certificates, while the corresponding data for the population (denominator) are obtained from census sources. If the occupational data from these two sources are inconsistent, or if the number of people in different population groups are inaccurately coded, the mortality figures obtained for employees might be higher or lower than they are in reality. The problem has received consideration mainly in the UK, but it seems to have only little practical significance. Numerator-denominator bias does not occur when using individual-level datasets, where data on the social position of both the deceased and other population are drawn from the same sources, as is the case in Finland and other Nordic countries. Indeed the artefact explanation has been largely discounted, and the socio-economic health inequalities and mortality differences observed are accepted as real.

Selection

The selection explanation suggests that health may influence social mobility during the individual's life span: in other words the focus in this model is on the impact of health status on social position. According to the explanation, people who are in good health are more likely to reach higher social positions,

whereas those who are in poor health are more likely either to remain at their same social level or to experience downward mobility. The thinking here is that health and the characteristics that determine health may influence the individual's social circumstances if they have an impact on how people manage in education and in the labour market, for example (Macintyre 1997). Social mobility happens not only within a generation (intra-generational mobility), but also between generations (inter-generational mobility). A person who has poor health may drop out of education and move into a lower social position than his or her parents. Intra-generational mobility takes place when a person in a higher position but with limited work ability moves down the social scale.

Apart from limitations in work ability and functional capacity, another aspect that needs to be considered is the labour market discrimination of the disabled and the chronically ill, both as job seekers and employees (West 1991). Severe physical injuries or mental health problems, for instance, may permanently compromise coping in education and in the labour market.

In the discussion following the publication of the Black Report, a distinction has been made between direct and indirect health selection, which refer to different kinds of social processes. In direct selection, poor health in itself contributes to the individual moving to a lower social position. In indirect health selection, a third factor enters the equation and influences both health and social position (West 1991). According to the indirect selection hypothesis, factors that cause diseases and increase the risk of death drive people into lower social positions, while predictors of good health create upward social mobility. For example, lifestyles during youth are associated not only with health in later life, but also with educational career advancement. Young people with unhealthy lifestyles are more likely not to receive more than basic education (Koivusilta et al. 2003). On the other hand there is also research evidence to indicate that height and obesity, for instance, are linked to social mobility: short and obese people are more likely to be downwardly mobile in the social hierarchy, while tall people and those of normal weight are more likely to be upwardly mobile (Macintyre 1988, Silventoinen 2003, Sarlio-Lähteenkorva 1999).

Culture and behaviour

While the selection explanation is concerned with the impacts of health on social position, the cultural/behaviour explanation concentrates instead on the impacts of social position on health. Social position is not considered a direct causative factor, but the thinking is that health inequalities may be caused through the mediation of cultural factors distinctive to socio-economic groups,

such as traditions, values and attitudes that influence their lifestyles, as well as their different health behaviours. Researchers are probably agreed on the significance of adverse health behaviours such as smoking, alcohol use, inadequate nutrition and physical exercise on the occurrence of major public health diseases and mortality. The same no doubt applies to the fact that these behaviours are shaped and influenced by cultural factors and social background. Unhealthy lifestyles are generally unequally distributed across socio-economic groups, as we will again see in this report (section 4.1). According to this explanation, lifestyles that have adverse health effects are more common among people with less education, among blue-collar workers, and in low income brackets, for instance, and this contributes to socio-economic health inequalities.

Materialist or structural explanation

The thinking behind the materialist or structural explanation is that material factors and living conditions impact the health of socio-economic groups in such a way as to cause health inequalities. The model covers a wide range of explanatory factors, including material living conditions in childhood and adulthood, working conditions, material income and wealth as well as housing conditions and home environment. Some of these factors are both temporally and causally closer to health and the development of health inequalities, others are more distant, underlying and often structural factors. As is the case with health behaviour, the impact of material factors on health inequalities derives from the uneven distribution of these factors in the population. People in lower social positions usually have less financial resources and poorer living and working conditions than people higher positions (Macintyre 1997, Martelin et al. 2004).

Explanations of health inequalities have been grouped and classified in other ways as well, and it has been suggested that various psychosocial and psychobiological mechanisms are also at play in the development of socio-economic health inequalities (Wilkinson and Marmot 2003). We return to these explanations briefly in the discussion below, which again is informed by the Black Report.

Interpretations of explanatory models and research strategies

There has been some tendency for researchers to cluster around their favoured explanations for health inequalities, to the point that one is tempted to refer

to different schools of thought. Indeed some researchers have adhered faithfully to just one single line of explanation, excluding all other possibilities. The health effects of social position have sometimes been contrasted with selection into social positions. Similarly, there are those who take the view that material living conditions and lifestyles are mutually exclusive explanations. Psychosocial factors and the impact of stress mechanisms have also been put forward as antithetical to explanations based on lifestyles and material factors.

Based on her analyses of the explanatory models outlined in the Black Report, Sally Macintyre (1997) elaborates on their interpretations and makes a distinction between 'hard' and 'soft' interpretations of health inequalities. 'Hard' explanations are one-sided and exclude all alternative and simultaneous explanations. A 'soft' explanation, then, is one that may incorporate explanatory factors from several different models.

The 'hard' research strategy tests just one hypothesis at a time, whereas the 'soft' strategy tests competing, simultaneous hypotheses that are grounded in different explanatory models (Lahelma 2001). However, there is no basis to argue that the complex processes that lie behind health inequalities can be unravelled and understood by reference to one explanatory model only. The research evidence accumulated since the Black Report supports the view that several factors contribute to the development of health inequalities. The relative weight of different factors may vary at different times and in different countries and depending on the population group, the dimension of social position, the particular aspect of health, or cause of death (Macintyre 1997). Comparisons of the various explanatory models have shown that material factors, working conditions, health behaviours and psychosocial factors each have their own impact on socio-economic health inequalities. Furthermore, these impacts are usually interwoven with one another, and it is often impossible to single out one cause or one group of causes that is responsible for the disparities observed. However, based on current knowledge it seems clear that material living conditions and health behaviour play a particularly important role in the generation of health inequalities (Lynch and Kaplan 2000, Laaksonen et al. 2005b, Rahkonen et al. 2006).

Material living conditions and health behaviours are typically studied as individual-level factors. Richard Wilkinson (1996), however, has advocated a broader interpretation according to which health and mortality are influenced by general inequality, for instance the size of income differentials in society rather than the income of each individual. This theory has it that life expectancy is shorter in societies with wide income differentials than in societies with a more egalitarian income distribution. The thinking is that the influences of

community inequalities operate via a psychosocial mechanism: sharp inequalities mean that people in lower positions suffer from their relatively poorer position, causing stress and therefore an increased risk of illness and premature death. In advanced countries, however, this theory has failed to explain the associations between size of income differentials and health. For example in Finland, income differentials are among the smallest in the world, yet the male life expectancy is no higher than the European average, and socio-economic mortality differences are large by European comparison. Empirical studies have found only weak associations between income differentials in society and public health. The individual's income and other dimensions of socio-economic position, on the other hand, show strong associations with mortality and morbidity (Mackenbach 2002).

Most researchers working with health inequalities today agree that several different factors and their combinations are involved in their causation, and that therefore it is necessary to have several different explanations. The structure of society and social inequality in childhood and later on in life lay the foundation for people's living conditions and health behaviours. These, in turn, form the basis for the development of socio-economic health inequalities. However, the relative weight and role of different factors in health inequalities may vary in different countries, at various times and in various groups of the population. Inequality at the community level should not be contrasted with inequality resulting from individual-level phenomena, because individual factors are not independent of the wider context. Instead, health inequalities are created in socio-economic and other groups as a result of social and economic processes that cause inequalities in many different ways. Individual-level factors are well suited for purposes of empirical research, and relevant information is readily available. Earlier Finnish studies have been able to identify a number of individual-level factors that are involved in the development of socio-economic health inequalities (Laaksonen et al. 2008, Pensola 2003).

The research evidence on the causes of inequalities

As will be shown in detail in this report, socio-economic differences in morbidity are effectively unchanged and differences in mortality have actually increased, even though public health as a whole has improved. Socio-economic health inequalities are clear, hierarchic and deeply entrenched. But what are the specific factors that lie behind these inequalities in Finland?

Researchers in Finland have access to good sources of reliable information on the health of Finnish people. In particular, Finland's register data on mortal-

ity count among the best in the world, which means that the artefact explanation can straightaway be discounted.

Social mobility has long been high in Finland. In the wake of modernisation, the number of people in white-collar jobs as a proportion of the total labour force has increased, at the same time as the numbers in blue-collar jobs and agriculture have decreased. Every generation has been better educated than the one before, and has often ascended to higher social positions than their parents (Alestalo and Flora 1994). However, people with health problems at a young age are at greater risk of being unable to complete more than basic education and consequently of being relegated to a low social position. Some selection of this kind has probably happened, but for the most part the direction of mobility has been upwards, leaving only limited scope for social decline (Rahkonen et al. 1997a). The selection explanation received some support in a study which found that the association between income and health became weaker when labour market position and incapacity for work were taken into account (Rahkonen et al. 2000). In other words, poor health reduces the prospects of earning a good income.

Selection is usually regarded as a negative phenomenon that engenders discrimination, but in welfare states there is also an officially supported route to selection. That is, people with health problems and limited work ability may be eligible for a transfer to less strenuous jobs in lower occupational positions. People with more severe illnesses, then, retire on early pension, i.e. their labour market position and possibly their income and social position more generally are lowered on grounds of health. Research has shown that while selection does have some explanatory power, it only explains a small portion of socio-economic differences in mortality and morbidity (Davey Smith et al. 1994, Power et al. 1996).

Health behaviours and lifestyle factors influence many diseases and causes of death. Unhealthy lifestyles such as smoking and heavy alcohol use, unhealthy eating habits and obesity are most common in lower social positions, as is shown in closer detail later in this report (sections 4.1 and 4.2). For example, lung cancer deaths, which are largely attributable to smoking, are almost three times higher among blue-collar workers than among upper white-collar workers. Coronary heart disease and alcohol deaths are also far more common in blue-collar than white-collar groups (see Chapter 3.1 in this report). Furthermore, it has been found that about one-quarter of the differences in mortality between blue-collar and white-collar male workers is explained by alcohol-related causes of death (Mäkelä 1999). Estimates are that smoking accounts for roughly the same share. In the light of our present knowledge, it is clear that

health behaviours account for a significant proportion of socio-economic differences in morbidity and mortality in Finland.

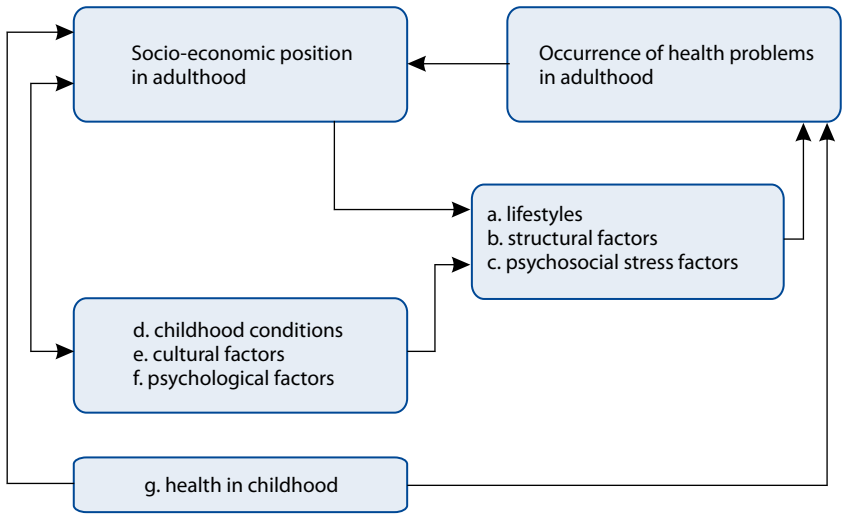
Inadequate living conditions are a breeding ground for poor health and many diseases. Many aspects of the physical environment and material living conditions such as poverty, low income, economic hardship, working conditions, housing standards and the living environment are linked with health, and contribute to socio-economic health inequalities (Laaksonen et al. 2005a). Several studies have confirmed the associations between adversities and inequality experienced in childhood with health inequalities in adulthood. In part, this is explained by the various impact mechanisms of social and economic conditions in childhood causing an increased occurrence of health problems during adulthood in all population groups. On the other hand, part of the explanation lies in the fact that childhood adversities lead to a low social position in adulthood and in this way create health inequalities (Rahkonen et al. 1997b, Mäkinen et al. 2006).

One factor that has received attention among circumstances in adulthood is that of working conditions. Work-related stress may adversely affect health and cause health inequalities (Lundberg 1990, Rahkonen et al. 2006), but even unemployment can have adverse health effects (Lahelma 1994). In the case of unemployment, however, it is often difficult to distinguish between causative and selective factors (Lahelma 1994, Martikainen and Valkonen 1996). The size of health inequalities is influenced by labour market position, and those inequalities are smaller in the employed than in the unemployed population (Martikainen and Valkonen 1999, Manderbacka et al. 2001), because large numbers of people who are in poor health exit the labour force, particularly in physically demanding and stressful occupations.

The role of psychosocial factors has been emphasised especially in connection with working conditions, but more generally as well (Wilkinson and Marmot 2003). For example, low job control and high job demands may influence health and health inequalities (Marmot et al. 1997, Rahkonen et al. 2006). It is thought that lack of social relations and support may have a similar effect. Stress is regarded as an important psychosocial mechanism whose health effects may occur through immunological mechanisms, hormone function or health behaviours.

Figure 1 provides a summary illustration of factors that contribute to the development of health inequalities and how they are interconnected (Mackenbach et al. 1994). Conditions in childhood and adulthood both have an influence on health inequalities. The relations are mediated by specific exposures and factors; examples include material, structural and psychosocial factors in

Figure 1. Factors influencing socio-economic health inequalities.



Source: Mackenbach et al. 1994

the workplace and outside work, as well as lifestyles and health behaviours. In addition, poor health may lead to selection to a lower social position.

One noteworthy omission from the explanatory models reviewed above is the role of health services. As yet there has been only a modicum of discussion on the influence of health services on health inequalities. However, even the use of health services varies by social position. As a rule it seems that the greater the influence of market mechanisms, the greater the socio-economic differences in health service use. For example, dental health care in Finland is largely organised through the private sector, and there have been marked socio-economic differences in the use of these services. Oral health services have a direct impact on the socio-economic differences in dental health (Arinen et al. 1998). There are also reports of socio-economic differences in the treatment of serious health problems, such as cardiovascular diseases (see also Chapter 4.3). Treatments for these diseases have developed considerably and have been widely adopted. This has increased survival rates among sufferers, but the socio-economic differences in the use of treatments remain (Hetemaa et al. 2003). There are inequalities in the use of other health services, too (see Chapter 4.3), which may contribute to difference in morbidity and mortality in general, but our knowledge of these processes is still limited.

In conclusion

During the 25 years since the publication of the Black Report, our knowledge of the main reasons and mechanisms behind health inequalities have continued to grow and expand. Material conditions and health behaviours in childhood and adulthood as well as psychosocial factors all influence health and cause health inequalities between population groups. Some selection to socio-economic groups takes place on the basis of health and health-determining factors, but this is not thought to have very much significance in the overall causation of health inequalities. In other words health inequalities are attributable primarily to health determinants, which vary by socio-economic position. Based on our current knowledge and understanding, the three major causes of health inequalities are material factors, health behaviours and psychosocial factors (Graham 2000). However, opinions vary as to which of these causative categories carries the most weight and which of them is less important. The research evidence suggests that together, material and behavioural factors account for about half of the socio-economic health inequalities observed (Lynch and Kaplan 2000, Laaksonen et al. 2005b).

There is much more research on the impacts of individual factors on health inequalities than research on the connections between different factors and paths of influence. However, a more in-depth understanding of the processes leading to health inequalities requires a simultaneous examination of several explanatory models and factors. It is important that future studies pay more attention to the explanations of the inequalities so that we can more accurately identify the factors that lie behind these deeply entrenched health inequalities.

Given the diversity of the processes responsible for health inequalities, it is clear that there can be no single way of reducing them. What we can say on the basis of our current research knowledge is that interventions to improve inadequate living and working conditions and to prevent obesity and unhealthy behaviours, especially smoking and heavy alcohol use in lower socio-economic groups, can have great potential significance. These kinds of interventions could curb the increase in mortality differences, in the best case even reverse the current trends and reduce health inequalities. Success in reducing health inequalities would improve not only equity in health, but public health at large.

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3 SOCIO-ECONOMIC HEALTH INEQUALITIES AND HOW THEY HAVE CHANGED

3.1 Socio-economic differences in mortality

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Social and educational differences in mortality are among the most important indicators used both in research on health inequalities and in health policy making. The extensive register data available in Finland coupled with the system of personal identity numbers make it easier to study these differences in Finland than in most other countries.

The Population Research Unit at the University of Helsinki Department of Sociology has worked closely with Statistics Finland to study and monitor socio-economic mortality differences since the 1980s (e.g. Valkonen et al. 1990, Martikainen and Valkonen 1995). These studies have consistently shown that in both men and women, life expectancy is considerably longer among white-collar than blue-collar workers. During the 1970s there were only marginal changes between the different social groups, but since then the differences have steadily increased. Similar results have been obtained for mortality differences by educational level. (Valkonen 1999, Valkonen et al. 2000, Martikainen et al. 2001, Valkonen et al. 2003, Valkonen and Martikainen 2007.)

One of the eight main targets set out in the Health 2015 Public Health Programme (Government Resolution, MSAH 2001) is to reduce health disparities between population groups. The programme's quantitative targets concern the differences in life expectancy between vocational groups, on the one hand, and between educational groups, on the other. The baseline was taken as the difference in average life expectancy of upper-level white-collar and blue-collar workers at age 35 in 1991–1995, which was 5.5 years for men and 3.0 years for women. The target specified in the programme was to reduce these differences by one-fifth by 2015. A similar target was set for the differences between people with tertiary-level and primary education, which in 1991–1995 were of the same magnitude as the differences between socio-economic groups. The WHO Health 21 programme for the European Region has a similar target: the difference in life expectancy between socio-economic groups is to be reduced by at least 25 per cent by 2020 (WHO 1999).

This Chapter describes how the life expectancies of different socio-economic and educational groups have developed from 1983–1985 to 2003–2005, and compares these trends against the targets set out in the Health 2015 programme. A further aim is to see how different causes of death have contributed to changes in life expectancy in various social groups and to compare the differences in Finland with those seen in other countries.

The results are based on data compiled by Statistics Finland on deaths in 1983–2005. Using personal identification numbers, these data are linked with personal data from Statistics Finland's population censuses in 1980, 1985, 1990, 1995 and 2000. The basic dataset comprises all persons in the Finnish population during the five-year period following each population census, with the exception of those who migrated in or out of Finland during this period. The analysis is confined to the population aged 35 or over.

Changes in mortality differences: life expectancy at age 35 in different social groups in 1983–2005

Our analysis of mortality differences by social groups is based on longitudinal census data on people's socio-economic status as defined according to Statistics Finland's classification. This classification refers to such factors as occupation, occupational status and main activity. For purposes of mortality studies, researchers at the University of Helsinki Department of Sociology have revised and reduced this classification (see Valkonen et al. 1992). Here, the unemployed, pensioners and other economically non-active groups (excluding students) are classified on the basis of their former occupation, or on the basis of the occupation of the household's reference person. If economically non-active groups were not classified into social groups in this way, the mortality rates obtained for social groups would underestimate the true figures, and the size of error would vary between the social groups. This is because mortality among the unemployed and the disabled is relatively high, and there are marked socio-economic differences in the prevalence of unemployment and work disability.

Information on a person's social group is only obtained for census years, which means that it is not possible to take account of changes during the interim between censuses: each person's social group remains the same throughout the five-year period following the census. The classification of occupational groups into social groups was changed following the revision of the occupational classification in 2001 when Statistics Finland defined the socio-economic status positions of the new occupational groups. However, these changes have no significant impact on the results of this study because the classification of social groups is used only at its crudest level.

Mortality rates have been calculated separately for male and female five-year age groups by year and social group. From these mortality rates, we have calculated life tables for each year by social groups (Shryock and Siegel 1976). The life expectancies at age 35 have been extracted from these tables: these figures describe the average number of years that people in a certain social group

are expected to live after turning 35. Overall changes in life expectancy by social group are also analysed into component parts by cause of death and age group by using a demographic decomposition method (United Nations 1988).

Table 1 shows the social group classification used in this research as well as the relative sizes of the different groups during the three-year periods used in the analysis. Among men, blue-collar workers have been by far the largest group throughout, even though their share declined by more than four percentage points from the 1983–1985 period to 2003–2005. Most of this change took place in the 1990s. The proportions of upper-level and lower white-collar workers and entrepreneurs increased, and the proportion of farmers decreased. Among women, too, blue-collar workers were by far the biggest group in 1983–1985, but their share decreased by one-fifth by the 2003–2005 period. Lower white-collar workers emerged as the largest group in the early 1990s. The category of 'others' is made up of students and persons who cannot be classified because of missing data.

Table 1. Breakdown (%) of men and women aged over 35 into social groups in 1983–1985, 1988–1990, 1993–1995, 1998–2000 and 2003–2005 (based on person years).

	1983–85	1988–1990	1993–95	1998–2000	2003–05
Men					
Upper white-collar workers	12.7	14.2	15.1	16.1	16.7
Lower white-collar workers	15.6	16.6	16.9	17.2	18.4
Blue-collar workers	49.4	47.9	46.5	45.3	45.0
Farmers	15.0	12.8	11.3	9.3	7.8
Other entrepreneurs	5.9	7.2	8.9	9.6	9.4
Other	1.3	1.3	1.3	2.6	2.7
Total	100	100	100	100	100
Person years (1 000)	3 231	3 543	3 799	4 070	4 284
Women					
Upper white-collar workers	8.7	9.7	11.0	12.3	13.8
Lower white-collar workers	30.7	34.5	37.0	38.9	39.1
Blue-collar workers	39.4	36.8	33.4	31.4	31.2
Farmers	14.5	12.1	11.2	8.5	6.8
Other entrepeneurs	4.0	4.5	5.1	5.5	5.5
Others	2.8	2.3	2.4	3.3	3.5
Total	100	100	100	100	100
Person years (1,000)	3 882	4 153	4 362	4 589	4 767

Figure 1. Life expectancy of men and women aged 35 by social group in 1983–2005 (three-year moving averages).

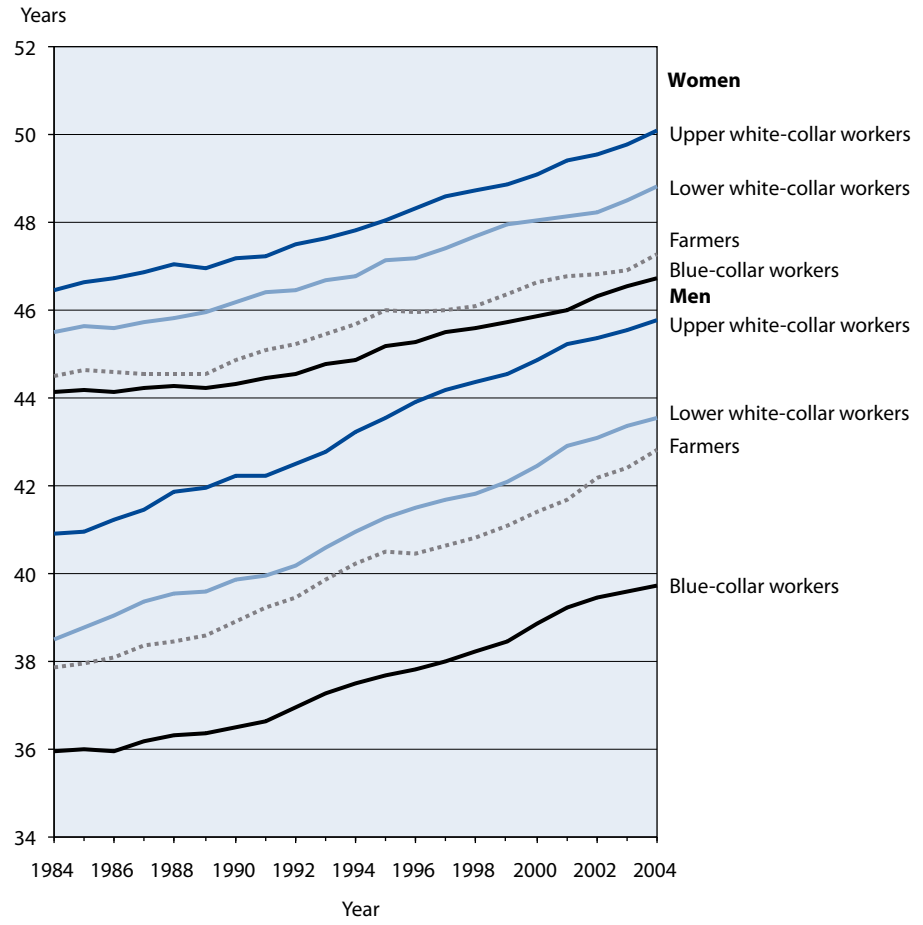


Figure 1 shows the life expectancies for people aged 35 by social group in 1983–2005. To reduce random variation, three-year moving averages are used instead of annual data. Data for entrepreneurs and 'others' are excluded for readability, but they are included in Table 2.

Over the 20 years from 1983–1985 to 2003–2005, the life expectancy of men aged 35 increased by 4.6 years (Table 2). The difference between the life expectancies of upper white-collar and blue-collar workers during the former period was 5.0 years and during the latter period 6.1 years, i.e. the difference increased by 1.1 years. The significance of this difference is emphasised by the observation that it was not until the 2000s that the life expectancy of blue-collar workers reached the same level recorded for upper white-collar workers in the 1970s (Martikainen and Valkonen 1995).

Table 2. Life expectancy of men and women aged 35 in 1983–1985, 1988–1990, 1993–1995, 1998–2000 and 2003–2005 by social group.

	1983–85	1988–90	1993–95	1998–2000	2003–05	Change 1983–85 – 2003–05
Men						
Upper white-collar workers	40.9	42.0	43.2	44.6	45.8	4.9
Lower white-collar workers	38.5	39.6	41.0	42.1	43.5	5.0
Blue-collar workers	36.0	36.4	37.5	38.5	39.7	3.8
Farmers	37.9	38.6	40.2	41.1	42.8	5.0
Entrepreneurs	38.2	39.2	40.6	41.7	43.2	5.0
Others	29.4	29.5	32.2	35.2	36.9	7.5
Total	37.2	37.9	39.2	40.4	41.8	4.6
Difference between upper white-collar and blue-collar workers	5.0	5.6	5.7	6.1	6.1	1.1
Women						
Upper white-collar workers	46.4	47.0	47.8	48.9	50.1	3.6
Lower white-collar workers	45.5	45.9	46.8	47.9	48.8	3.3
Blue-collar workers	44.1	44.2	44.9	45.7	46.7	2.6
Farmers	44.5	44.6	45.7	46.4	47.3	2.8
Entrepreneurs	45.5	46.0	46.5	47.5	48.3	2.8
Others	39.4	39.2	41.3	42.5	44.3	4.9
Total	44.7	45.0	46.1	46.9	48.1	3.4
Difference between upper white-collar and blue-collar workers	2.3	2.7	3.0	3.2	3.3	1.0

The widening of the difference from the 1980s to the 2000s was not a steady process. Among men, the gap widened most rapidly during the economic upswing in the late 1980s (0.6 years), slowing down during the recession of the early 1990s (0.1 years), only to accelerate again towards the end of the 1990s (0.4 years). From 1998–2000 to 2003–2005, the life expectancy of blue-collar workers increased by roughly the same amount as for upper white-collar workers, and the growth of the difference came to a halt.

Throughout the 20-year period under review, the life expectancy figures for male lower white-collar workers, farmers and entrepreneurs have been midway

between the figures for blue-collar and upper white-collar workers. The life expectancies of these two groups have increased at the same rate as the life expectancy of upper white-collar workers. In other words the difference between the life expectancy of blue-collar workers and other social groups has grown to the same extent as the difference between blue-collar workers and upper white-collar workers.

Women's life expectancy increased from 1983–1985 to 2003–2005 by 3.4 years. During this same period, the gap between upper white-collar workers and blue-collar workers increased from 2.3 to 3.3 years. In absolute terms the gap increased by roughly the same amount as it did for men, but in relative terms the increase among women was twice as high as among men. As was the case in men, the difference in life expectancy between female social groups increased most rapidly in the late 1980s. The widening of the gap then slowed down, and from the late 1990s to the early 2000s it increased by no more than 0.1 years. In contrast to men, the difference between female social groups did not grow very rapidly in the late 1990s.

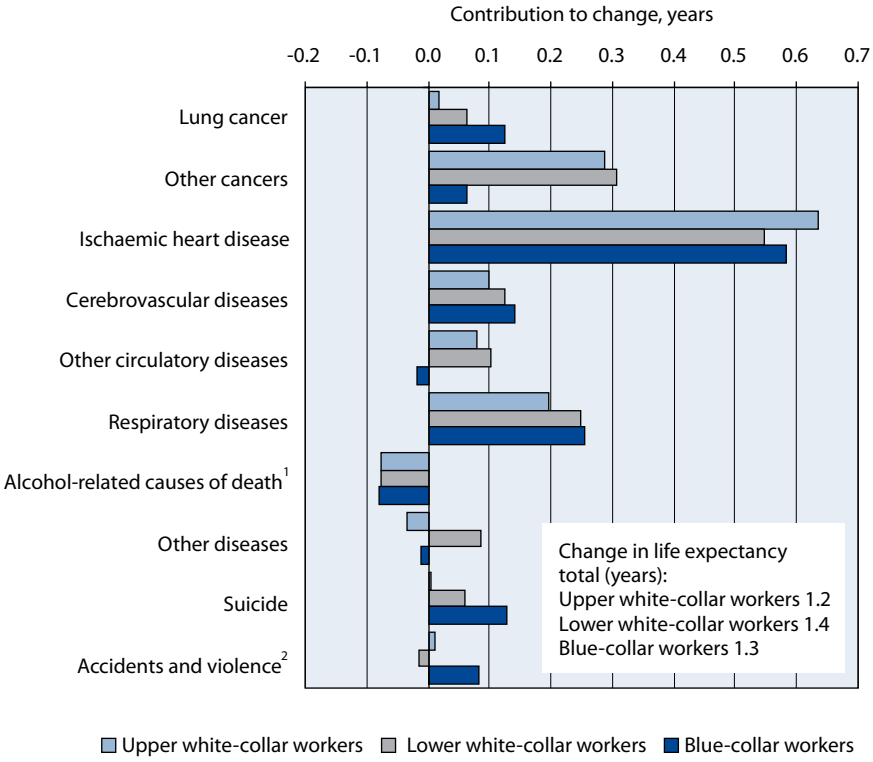
Among women, lower white-collar workers have represented the largest social group since the 1990s (Table 1). In 1983–1985, life expectancy in this group was 1.4 years higher than in blue-collar workers, increasing further to 2.1 years by 2003–2005. In contrast to men, the change in the life expectancies of farmers and entrepreneurs came closer to the change in the life expectancy of blue-collar workers than to the change in white-collar workers.

Impact of causes of death on the change in life expectancies from 1998–2000 to 2003–2005

The life expectancy of all men aged 35 increased from 1998–2000 to 2003–2005 by 1.4 years. Almost half of this increase is explained by the continued rapid decline in ischaemic heart disease (IHD) mortality. Mortality from most other causes decreased as well. The most important among these other cause-of-death categories included respiratory diseases, cerebrovascular diseases, and cancers. Mortality from alcohol-related causes (alcohol diseases and poisonings) was the only category which showed a slight increase.

The life expectancy of women aged 35 increased from 1998–2000 to 2003–2005 by 1.2 years, i.e. less than the increase recorded for men. The main factor contributing to the reduced gender difference was IHD mortality, accounting for 0.2 years. However, in women, too, lowered IHD mortality contributed most to increasing life expectancy: together with reduced mortality from respiratory diseases and cerebrovascular diseases, it explained more than 80 per cent of

Figure 2. Contribution of causes of death to change in life expectancy among men aged 35 from 1998–2000 to 2003–2005 by social group.



[1] Alcohol-related diseases and accidental alcohol poisoning
[2] Excluding alcohol poisoning

the increase in life expectancy. Higher mortality from alcohol-related causes slowed the increase in women's life expectancy almost as much as in men.

As we can see in Figure 2, male mortality from virtually all causes of death decreased from 1998–2000 to 2003–2005 in all three social groups. The one clear exception is alcohol deaths, which increased to the same extent in all three social groups. With respect to the change in life expectancies, alcohol-related causes of death have only little significance, accounting for just under -0.1 years. In the 1990s, on the other hand, alcohol-related deaths increased the difference in life expectancy because alcohol mortality increased among blue-collar workers but not among upper white-collar workers (Valkonen et al. 2003).

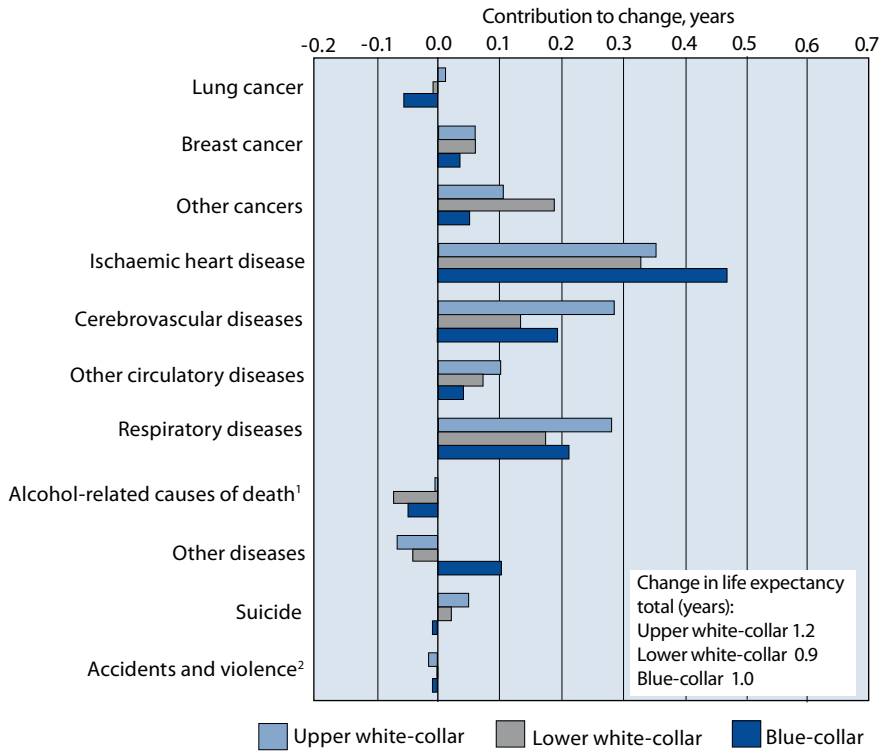
In the following table, causes of death are ranked according to the direction and size of their impact on the change in life expectancy difference among male upper white-collar and blue-collar workers. Positive figures indicate that the decrease in mortality has been greater for upper white-collar than for blue-collar workers, causing the gap to widen between the groups. Negative figures, then, indicate that changes in mortality by social group have reduced the life expectancy difference.

Cause of death	**Impact (in years) on difference in life expectancies among men aged 35**
Cancers other than lung cancer	0.22
Other circulatory diseases	0.10
Ischaemic heart disease	0.05
Alcohol-related causes of death	0.00
Other diseases	-0.02
Cerebrovascular diseases	-0.04
Respiratory diseases	-0.06
Accidents	-0.07
Lung cancer	-0.11
Suicides	-0.12
Total	-0.05

There is one outstanding difference compared to the situation in the 1990s (Valkonen et al. 2003): mortality from accidents and suicides decreased more among blue-collar than upper white-collar workers in the early 2000s. This narrowed the life expectancy differences between the groups by 0.2 years. Otherwise the results are very similar to those recorded in the 1990s. Mortality from cancers other than lung cancer continued to decrease much more rapidly among upper white-collar than blue-collar workers. In all groups the decrease in IHD mortality had the greatest impact on the increase in life expectancy, among upper white-collar workers somewhat more than among blue-collar workers. Mortality from lung cancer continued to decrease more sharply among blue-collar than white-collar workers.

The life expectancy of female upper white-collar workers aged 35 increased by 0.2 years more than that of female blue-collar workers (1.2 versus 1.0 years) (Figure 3). In most causes of death the decrease in mortality was greater among upper white-collar workers, but blue-collar workers benefited considerably more from the decrease in IHD mortality and in mortality from

Figure 3. Contribution of causes of death to change in life expectancy among women aged 35 from 1998–2000 to 2003–2005 by social group.



[1]Alcohol-related diseases and accidental alcohol poisoning
[2]Excluding alcohol poisoning

'other diseases'. In 2003–2005, no more than 13.8 per cent of all women aged 35 were upper white-collar workers. Because of the small size of this group, the number of deaths from rarer causes in particular was very low, and it is possible that the results are influenced by chance.

The life expectancy of the largest social group among women, i.e. lower white-collar workers, is clearly closer to the figure for upper white-collar workers than for blue-collar workers. However, over the period from 1998–2000 to 2003–2005, the life expectancy of lower white-collar workers increased by 0.3 years less than it did for upper white-collar workers. This was mainly due to the fact that mortality from cerebrovascular diseases and respiratory diseases decreased less among lower than upper white-collar workers. Furthermore, the life expectancy of lower white-collar workers increased slightly less (0.1) than the life expectancy of blue-collar workers: this was due to the much sharper decrease in IHD mortality among female blue-collar workers.

Difference in life expectancy between upper white-collar and blue-collar workers in 2001–2005: proportions of causes of death and age groups

The discussion above considered the contribution of causes of death to *changes* in life expectancy differences between social groups. Here, we are interested to explore what accounts for the *differences* in life expectancy between two social groups (upper white-collar and blue-collar workers) during the five-year period from 2001 to 2005.

Although IHD mortality has rapidly declined over the past few decades, it still remains by far the most significant cause of socio-economic mortality differences (Table 3). IHD accounted for more than one-quarter of the life expectancy difference between male upper white-collar and blue-collar workers. Taken together, circulatory diseases accounted for 38 per cent of the overall socio-economic difference among men. Among other causes of death, the most important were alcohol-related causes, which accounted for 13 per cent of the difference in life expectancy between upper white-collar and blue-collar workers. In addition, other behavioural causes of death (lung cancer, suicides, and accidental and violent deaths) explain almost one-quarter of the difference. Other causes of death, therefore, account for no more than 25 per cent of the difference.

Table 3. Contributions of various causes of death to the difference in life expectancy between upper white-collar and blue-collar workers aged 35 by gender in 2001–2005.

	Years		Per cent	
	Men	Women	Men	Women
Lung cancer	0.57	0.14	9.4	4.2
Breast cancer	–	–0.10	–	–2.9
Other cancers	0.49	0.36	8.0	10.7
Ischaemic heart disease	1.58	0.94	26.2	28.1
Cerebrovascular diseases	0.34	0.39	5.6	11.6
Other circulatory diseases	0.39	0.27	6.5	8.0
Respiratory diseases	0.54	0.28	8.9	8.2
Alcohol	0.78	0.27	12.9	8.1
Other diseases	0.47	0.53	7.7	16.0
Suicide	0.33	0.11	5.4	3.3
Accidents and violence	0.57	0.16	9.3	4.7
Total	6.05	3.35	100.0	100.0

Among women, IHD and other circulatory diseases account for an even greater share of the difference in life expectancy between upper white-collar and blue-collar workers in 2001-2005, i.e. 48 per cent. On the other hand, the contribution of alcohol and other behavioural causes was clearly smaller than for men (20%). Mortality from breast cancer was somewhat lower among blue-collar workers than upper white-collar workers, but this had only a marginal influence on the difference between social groups. Among women cancers other than breast cancer and unclassified other diseases explain 31 per cent of the life expectancy difference.

Table 4 shows the proportions of different age groups in the life expectancy difference between upper white-collar and blue-collar workers aged 35 or over. Among men, almost half of the difference is explained by the higher mortality of blue-collar workers in the age group 55–74, one-fifth is attributable to mortality in the age group 45–54. Among women, the mortality differences are clearly concentrated in older age groups: more than half of the difference is attributable to mortality in people beyond working age, and almost one-third to mortality in people aged 75 or over.

Mortality differences between social groups among people under age 35

The data above described life expectancies at age 35 rather than the more conventional at-birth expectancy, because no up-to-date information are available on mortality among people under 35 by social group. Below, we proceed to review the results of earlier studies on mortality differences among people under 35 by social group, and on this basis offer our assessment of how differences by social group at birth could deviate from the life expectancy differences at age 35.

Table 4. Contributions of different age groups to the difference in life expectancy between upper white-collar and blue-collar workers aged 35 or over by gender in 2001–2005.

Age	Years		Per cent	
	Men	Women	Men	Women
35–44	0.74	0.41	12.3	12.1
45–54	1.22	0.55	20.2	16.3
55–64	1.46	0.61	24.1	18.3
65–74	1.48	0.72	24.5	21.4
75–84	0.96	0.72	15.8	21.6
85–	0.19	0.34	3.1	10.3
Total	6.05	3.35	100.0	100.0

The most recent data available on infant mortality by social group are for 1983–1989 (Notkola and Savela 1992). These data indicate that infant mortality was 25 per cent higher among children of blue-collar than upper white-collar workers. However, because of the low overall rate of infant mortality rate, this difference had no practical significance (less than 0.1 years) on the life expectancy difference between infants in different social groups (Valkonen et al. 1992).

No systematic differences were observed between the mortality rates of blue-collar and white-collar workers' children aged 5–14 in 1987–1995 (Pensola and Valkonen 2000). In other words mortality in this age group had no significant impact on the life expectancy differences between social groups.

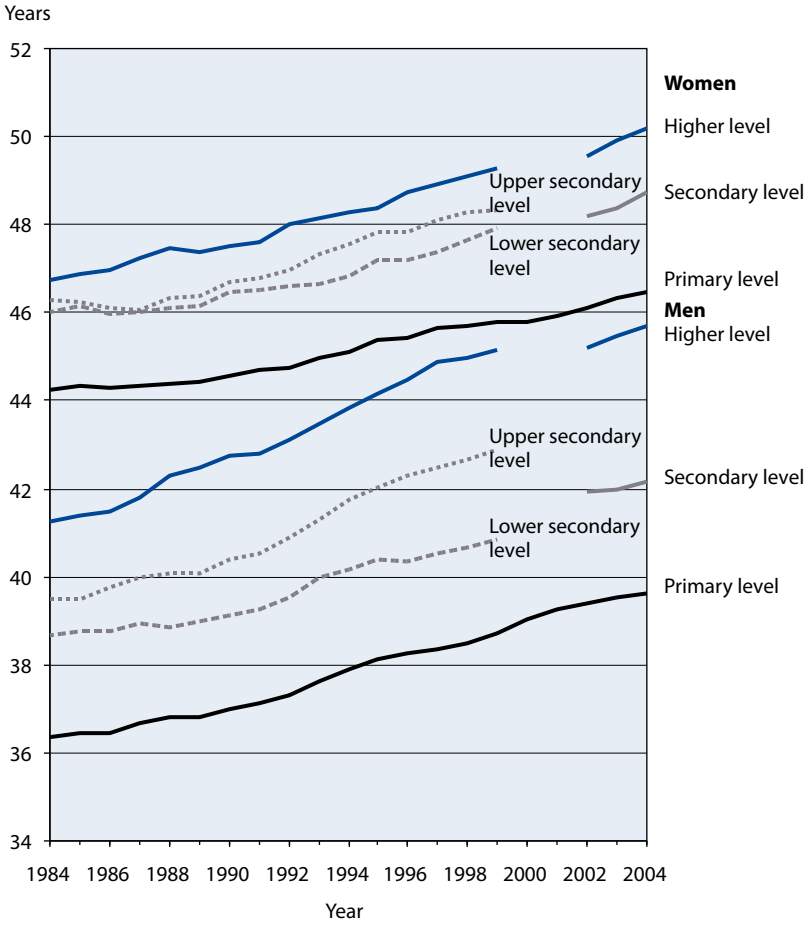
The results for mortality by social group in the age band 15–34 are based in part on data on the guardian's social group, and in part on the person's own social group (Rimpelä 1992). In this age category, the mortality of male blue-collar workers in 1986–1990 was twice as high as that of white-collar workers. The difference in life expectancy between upper white-collar and blue-collar workers was 0.4 years higher for persons aged 15 than for those aged 35 (Valkonen et al. 1992). In 1986–1990, the relative mortality differences between social groups were roughly the same for women aged 25–34 as they were for men, but only marginal in the age group 15–24 (Rimpelä 1992). The difference in life expectancy between upper white-collar and blue-collar workers was 0.2 years higher for women aged 15 than for women aged 35.

Based on the data from the 1980s, it is our estimate that the difference in life expectancy at birth between upper white-collar and blue-collar workers is just over (for men) and just under (for women) six months greater than the corresponding differences in life expectancy at age 35.

Changes in the life expectancy of educational groups in 1983–2005

Our description below of the changes in life expectancy among educational groups uses the same data and the same methods as the corresponding analyses of social groups above. Data on education are obtained from Statistics Finland's Register of Completed Education and Degrees. Developments in 1983–2000 are described using four educational categories: primary education or less (nine years or less education), lower secondary education (10-11 years), upper secondary education (12 years) and higher or tertiary education (13 years or more). Statistics Finland's classification of levels of education was revised in 1997 when large numbers of upper secondary degrees were re-classified as tertiary degrees. At the same time, the remaining upper secondary level degrees

Figure 4. Life expectancy of men and women aged 35 by educational level in 1983–2005 (three-year moving averages).



were merged with lower secondary level degrees to form a new category of secondary level degrees. For this reason the educational data for 2001–2005 are directly comparable with earlier figures only so far as they concern primary education. Below, life expectancies are first discussed using a four-tiered educational classification for 1983–2000 (i.e. the period for which the data are comparable) and then separately for 2001–2005. Life expectancies by educational groups are shown as three-year moving averages in Figure 4.

The life expectancy of men increased in all educational groups from 1983–1985 to 1998–2000, but both the magnitude and timing of this increase were different for different groups. The sharpest increase (3.9 years) was recorded

for people with a tertiary degree. In this group the increase was more or less rectilinear. Among men with an upper secondary degree, the increase in life expectancy was somewhat lower (3.4 years) than among men with a higher education.

In the early 1980s the life expectancy of men with a lower secondary education was almost the same as that of men with an upper secondary education, but since then the increase in their life expectancy has clearly slowed down. Life expectancy in this group hardly increased at all in the 1980s. Throughout the period from 1983–1985 to 1998–2000, the life expectancy of men with a lower secondary education increased by no more than 2.2 years, i.e. less than that among men with no more than a primary education (2.4 years).

The life expectancy of women with a primary education was considerably lower than that of women with more education throughout the period under review (Figure 4). The differences between other educational groups were less pronounced, especially when compared to the corresponding differences between men. Life expectancy increased fastest among women with a higher education (2.5 years), while the increases recorded for women with an upper and lower secondary education were almost the same (2.0 and 1.9 years). On the other hand, the life expectancy of women with a primary education increased by no more than 1.5 years, which means that the difference compared to the life expectancy of women with a higher degree increased by over 40 per cent, i.e. by one year during the 15-year period.

As was pointed out above, the data for 2001–2005 are not comparable with earlier years. Based on this relatively short period we are not in the position to draw very reliable conclusions on the development of life expectancies in different educational groups. However, it seems that during this period, the increase in life expectancy slowed down among men with a primary education and especially among men with a secondary education, whereas among men with a higher education the increase was faster than in other groups, particularly towards the end of the period. Among women, life expectancies in different educational groups continued to develop in line with earlier trends, and the difference in life expectancies between women with a primary education and those with more education continued to widen.

Socio-economic mortality differences: international comparisons

Apart from Finland there are comprehensive data on long-term trends in socio-economic differences in life expectancies for England and Wales. According to Mackenbach (2005), the difference in life expectancy at birth between

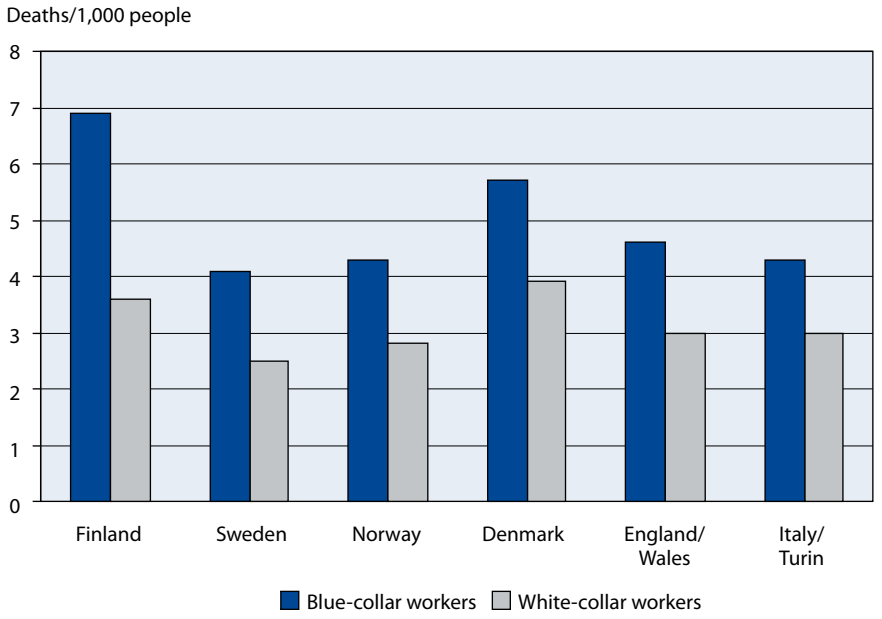
the highest and lowest socio-economic groups in England and Wales was 9.1 years for men and 6.2 years for women in 1992–1996. From 1997 to 2001, these differences were smaller (8.4 years for men and 4.5 years for women). In both periods and both genders, therefore, these differences were more pronounced than those observed between upper white-collar workers and blue-collar workers in Finland, even if it is taken into account that the Finnish data describe the life expectancy of persons aged 35 rather than life expectancy at birth. However, the data for England and Wales describe the difference between highest-level white-collar workers (Social Class I) and unskilled blue-collar workers (Social Class V). Based on more detailed data published by Hattersley (1999) for the period extending to 1996, it can be estimated that the difference in life expectancy between the classes corresponding to Finnish upper white-collar and blue-collar workers is not greater in England and Wales than it is in Finland.

Country differences in the extent of socio-economic differences are most typically assessed using age-adjusted mortality figures or indices calculated on the basis of these statistics. Figure 5 shows one example of this kind of comparison (Mackenbach et al. 2003). It describes the age-adjusted mortality of white-collar and blue-collar men aged 30–59 in the early 1990s in five countries and in Turin, Italy. The figure shows clearly that mortality among blue-collar men was much higher in Finland than elsewhere. Furthermore, with the exception of Denmark, the mortality of white-collar workers in Finland was higher than in the other countries. Both the relative and absolute mortality difference between social groups were higher in Finland than in any of the other countries or Turin. Earlier international comparisons have also shown that socio-economic differences among middle-aged men tend to be higher in Finland than elsewhere (e.g. Kunst 1998).

The results of international comparisons of socio-economic mortality differences are affected by a whole array of methodological factors: which indicators are used to describe socio-economic status, which countries, age groups and periods are covered by the research material, how reliable these materials are, what kind of indices are used to estimate the differences, how is the population divided into socio-economic groups. It is not surprising, therefore, that different studies yield different results. It follows that the socio-economic mortality differences observed for men of working age, for example, do not warrant the unequivocal conclusion that there are exceptionally large socio-economic mortality differences in Finland.

Recent international comparisons have given preference to education over occupational social group as an indicator of socio-economic status (Huisman

Figure 5. Age-adjusted mortality of male white-collar and blue-collar workers aged 30-59 in five Western European countries and in Turin around 1991–1995.



Source: Mackenbach et al. 2003

et al. 2004, Huisman et al. 2005). This has made it possible to include age groups beyond working age and both men and women in these comparisons. In addition, data have been obtained from a wider range of countries than earlier. The study by Huisman et al. (2004) concerned men and women aged 50 or over in seven European countries (Finland, Norway, England/Wales, Belgium, France, Switzerland and Austria), the city of Turin, and in a combined dataset from Madrid and Barcelona. The latter two datasets are excluded from the present review of country comparisons because of the methodological problems involved.

Huisman and colleagues found that absolute age group differences between educational groups were generally greater among men aged 50 or over in Finland than in six of the other countries, but smaller than in Austria. However, in many countries the relative mortality differences were larger or about the same as in Finland. The large absolute differences observed between educational groups in Finland were mainly explained by the higher mortality of men aged 50 or over in Finland than in the comparison countries.

Among women, both absolute and relative educational differences were in most age groups smaller in Finland than in Norway and Belgium, but larger

than in France. The relative differences in Finland were at roughly the same level as in the other countries, except for those mentioned above. Absolute educational differences varied by age group (Huisman et al. 2004).

In their more recent comparison of six countries (Finland, Norway, England/Wales, Belgium, Austria and Switzerland), Huisman et al. (2005) use partly the same material as in their earlier study. This comparison covers all people aged 45 or over as a single group rather than dividing them into age groups. According to the results for the early 1990s, absolute mortality differences between men with at least an upper secondary education and men with a lower secondary education or less were greatest in England and Wales, followed by Belgium, Austria and Finland. Relative differences were greater in Austria than in other countries. In most other countries, including Finland, the relative differences were roughly of the same magnitude. Among women, absolute mortality differences were the third biggest in Finland, but the relative differences were the smallest. All in all, these most recent comparative studies based on education suggest that Finland does not differ as sharply from other countries as earlier results concerning mainly working-age men have given to understand. The wide socio-economic gaps seen in the mortality of working-age men in Finland are probably linked with the high mortality from alcohol-related causes and accidents. However, no reliable comparative data are available on alcohol mortality.

Summary of results and comparison with earlier studies

In 1983–2005, population mortality trends in Finland were generally in line with health policy goals in that life expectancy increased clearly in both genders, and particularly in men. This was true of all social and educational groups, but the differences between the extreme groups widened particularly in the late 1980s. According to the targets set in the Health 2015 programme, the life expectancy difference between male upper white-collar and blue-collar workers aged 35 should be reduced by more than one year from the early 1990s to 2015. However, from 1993–95 to 1998–2000, the difference actually increased by 0.4 years. From the latter period through to 2003–2005, the difference remained more or less unchanged. The difference in the life expectancy between men with a higher and a primary education should have decreased in the same proportion as it did between social groups, but from 1993–1995 to 1998–2000 the difference increased by 0.5 years. Because of changes made to the educational classification, the data on life expectancy differences between educational groups in the early 2000s are not comparable with earlier data. However, it

seems that the difference in the life expectancy between the highest and lowest educational group continued to widen in the early 2000s.

According to the Health 2015 programme, the difference in the life expectancy between female upper white-collar and blue-collar workers aged 35 should decrease by about 0.6 years by 2015, but from 1993–1995 to 1998–2000 the difference actually increased by 0.2 years. In the early 2000s, the gap continued to widen, albeit at a somewhat slower rate. The gap between the life expectancy of people with a higher and primary education seems to be continuing to widen as well.

The life expectancy difference between the extreme groups provides a clear and concrete way of setting targets for the reduction of socio-economic mortality differences and monitoring the achievement of those targets. From a research methodology point of view, however, this is not entirely unproblematic. One difficulty with comparisons over time is that the relative size of different groups does not remain constant. This is not a major problem when studying the mortality of male social groups, because here the distributions have not changed very significantly, but among women the change has been far greater. For example, from 1983–1985 to 2003–2005 the proportion of upper white-collar workers increased from less than 9 per cent to almost 14 per cent. The changes in educational breakdowns have been greater still. The reliability of comparisons over time is further undermined by the revision of the educational classification. At the same time as the proportions of blue-collar workers and those with no more than a primary education have dwindled, there has presumably also been greater selection to these groups so that they now include larger proportions of underprivileged and socially marginalised groups as well as heavy drinkers and smokers. Part of the increase in the life expectancy difference is probably explained by changes in the population's socio-economic and educational structure. Having said that, it is clear that these changes cannot account for most of the growth of the differences since the 1980s. The time span has simply been too short, and the difference has clearly increased between male social groups as well, where the change in distributions has had less of an impact.

In our earlier studies on changes in mortality differences from 1981 to 2000, we concluded that the differences observed between social groups cannot be accounted for by any single and simple explanation, such as the growth of general social inequality (Valkonen et al. 2000, Martikainen et al. 2001, Valkonen et al. 2003). The differences have opened up partly as a result of mutually independent cause-of-death changes working in different directions, which may have differential significance during different periods, for different genders and

in different age groups. The development of mortality differences can best be explained by decomposing the overall change by cause-of-death categories and age groups and by analysing the contributing factors in each case, for instance by studying changes in living conditions and lifestyles, changes in health care services and treatment practices, and by assessing the consequences of the changes in the structures and sizes of population groups. The results reported above for mortality by cause of death after 1998–2000 support the same conclusion that no single factor at the societal level can provide a very powerful explanation: in some causes of death mortality changes have increased and in others decreased the differences in life expectancy between social groups. Furthermore, some causes of death have had a different effect on the change in life expectancy difference in the 2000s than they did in the 1980s and 1990s.

Socio-economic differences in life expectancy increased less in the 1990s than in the 1980s (Valkonen et al. 2003, Valkonen and Martikainen 2007). This is explained by the fact that in the 1980s, mortality from IHD and other circulatory diseases, particularly among men, declined much faster in white-collar than in blue-collar groups. In the 1990s, IHD mortality decreased among male lower white-collar workers much more sharply than among upper white-collar and blue-collar groups, but this difference evened out in the early 2000s. Among men there are marked relative differences between social groups not only in IHD and cerebrovascular mortality, but other circulatory diseases as well. Nonetheless, on the whole, mortality from vascular diseases is a less significant factor behind the change in life expectancy differences between social groups than it used to be. Among women, blue-collar IHD mortality decreased more sharply in the 2000s than white-collar IHD mortality, which contributed to slowing the growth of the life expectancy difference. Even though IHD mortality has decreased considerably over the past few decades, it was still by far the major cause of life expectancy differences between social groups at the beginning of the 2000s.

The rapid widening of socio-economic differences in the 1980s was due not only to circulatory diseases, but also alcohol-related causes of death and accidental and violent deaths. Mortality in these categories increased in the whole population, but more so in blue-collar than white-collar groups. In the early 1990s the increase in alcohol-related mortality came to a halt, but resumed towards the end of the decade (Herttua et al. 2007), particularly in blue-collar workers (Valkonen et al. 2003). Alcohol-related mortality has continued to grow in the present decade, depressing male life expectancy to the same extent among both upper and lower white-collar groups and among blue-collar groups. Among women, the increase in alcohol-related mortality has taken a

heavy toll on the growth of life expectancy among lower white-collar and blue-collar workers, but not among upper white-collar workers.

In the 2000s, changes in lung cancer mortality followed a similar pattern to that seen in the 1990s. Lung cancer mortality among men continued to fall, and the change was more pronounced among blue-collar than white-collar workers, where mortality had already dropped to a fairly low level earlier. Among women, lung cancer mortality increased in the early 2000s and had the most negative impact on life expectancy in blue-collar workers.

Among men, the cause-of-death category contributing most to the increased life expectancy difference between blue-collar and upper white-collar groups at the beginning of the 2000s, was cancers other than lung cancer. Among women, too, cancers other than lung cancer and breast cancer decreased much less sharply in blue-collar than white-collar workers. Even in the 1990s, both female and male mortality from cancers other than lung cancer decreased more among white-collar than blue-collar workers, increasing socio-economic differences in life expectancy. Indeed, this disease category warrants more attention as a cause of socio-economic mortality differences. Different cancers have different aetiologies, and the only way to unravel the background of their mortality differences is to conduct detailed analyses for each type of cancer.

This study has shown that especially among women, socio-economic mortality differences are in large part attributable to mortality differences in the population who are beyond working age. These age groups must also be taken into account when planning programmes to reduce health inequalities.

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3.2 Self-rated health

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Introduction

One way to judge the success of Finnish social and health policy in recent decades is by reference to research results on mortality, morbidity and self-rated health. Self-rated health describes the subjective dimension of health. It is widely used as a health indicator in population health surveys, and it has also proved to be a strong predictor of institutionalisation and mortality (Manderbacka 1998). However, long-term trends in self-rated health have not been published as often as long-term trends in mortality (Lahelma et al. 1997, Rahkonen et al. 2004).

Our concern in this section is to describe the development of self-rated health in different educational and labour market status groups over the past 25 years, i.e. from 1979 to 2004. Furthermore, we will explore how the level of perceived health and educational differences in health in the elderly population have changed from 1993 to 2003. The economy has fluctuated widely during the periods under review. The 1980s, and the latter part of the decade in particular, saw strong cyclical growth. By the early 1990s, the economy swung into exceptionally deep recession, and unemployment soared from around 2 per cent in 1991 to 17 per cent in 1994. At the same time, many welfare benefits were cut (Heikkilä and Uusitalo 1997). The latter part of the 1990s saw quite vigorous economic recovery, but the unemployment rate remained relatively high. Since the turn of the millennium, economic growth has slowed again. The income distribution has been relatively even. Income differences decreased during the recession, but subsequently have shown a tendency to widen (Pajunen 2005).

The data reported here on self-rated health in the population of working age are drawn from the health behaviour survey by the National Public Health Institute's Health Promotion Unit (Health Behaviour and Health among the Finnish Adult Population, AVTK, Helakorpi et al. 2005). The population for this survey consists of all Finnish citizens aged 15–64. The discussion here is limited to men and women aged 25–64 at the time of the survey. The results for older people are based on a corresponding health behaviour survey in the population aged 65–84 (Health Behaviour and Health among the Finnish Elderly, EVTK, Sulander et al. 2004). Data collection in both these surveys has been designed with special consideration to comparability over time.

The measurement of self-rated health, education and labour market status

In both surveys, the respondents were asked the same question each year to assess their self-rated health: 'Do you feel that your current health status is 1) good, 2) fairly good, 3) average, 4) fairly poor, or 5) poor?' Self-rated health is usually examined using a dichotomous classification (see e.g. Lahelma et al. 1997, Kunst et al. 2005). In this study the focus was narrowed to those working-age respondents who reported their health as average or poorer and to those people aged 65 or over who considered their health rather poor or poor. A different cut-off point was chosen in these two population groups in order to get a sufficient number of working-age people in the poorer health category.

Socio-economic position was assigned on the basis of the number of years in education as indicated by the respondents in the questionnaire. The working-age respondents were divided into three educational groups: primary (9 years or less), secondary (10-12 years) and higher (13 years or more) education. For people aged 65 or over, a distinction was made between just two groups, viz. lower (8 years or less) and higher (9 years or more) education.

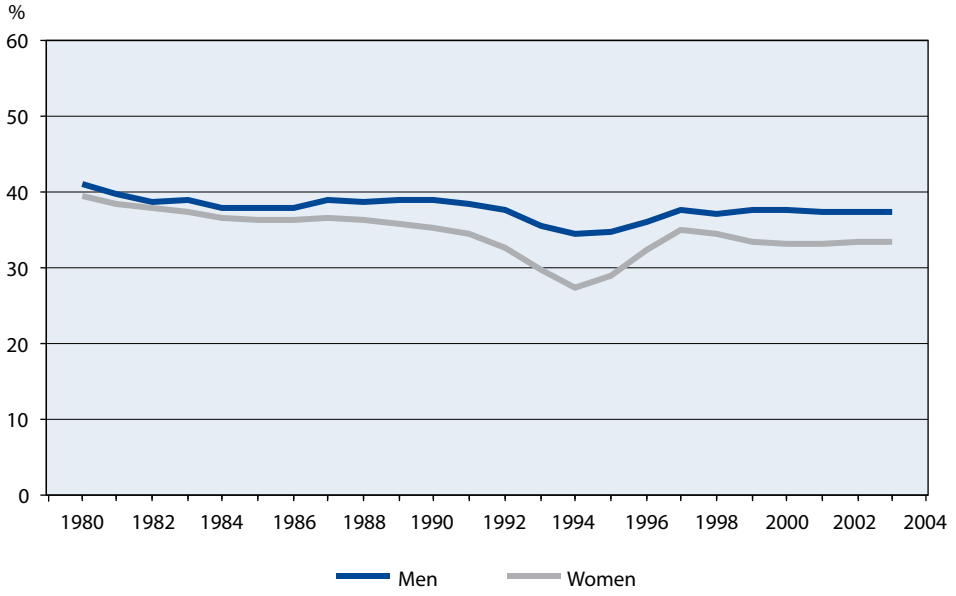
Since the period under investigation includes a spell of high unemployment in the early 1990s, we were also interested to examine the breakdown of self-rated health in the working-age population by labour market status. For this purpose the respondents were divided into three groups: 'employed', 'unemployed' and 'others'. The latter is a very heterogeneous group that among others includes students and people on disability pension; therefore the results for this group will not be shown here. The number of unemployed women in the 1980s was so low that the data available do not allow for a reliable analysis of their health status during that period.

The results are presented separately for men and women in the form of age-adjusted prevalence rates (%) of average or poorer self-rated health in educational and labour market status groups. To reduce random variation, three-year moving averages are used instead of annual data. Age adjustment was done by means of direct standardisation in ten-year age groups for working-age people and in five-year age groups for pensioners.

Change in differences in self-rated health

The self-rated health of working-age people improved to some extent during the period under study. In the early 2000s, more than one-third of the Finnish population aged 25–64 regarded their health as average or poorer (Figure 1).

Figure 1. Age-adjusted percentage of men and women aged 25–64 who rated their health as average or poorer in 1979–2004 (three-year moving averages).



Overall, self-rated health improved quite steadily, although it showed a clear improvement during the recession in 1992–1994. A significant but short-lived improvement was recorded in women's health in the early 1990s. However, the same steady trend soon resumed. Since 1998 the population's health has no longer improved. Men have reported slightly poorer health than women throughout the period under investigation, and the gender difference in health has remained more or less consistent. The self-rated health of people aged 65 or over also improved from the mid-1990s onwards. In 2003, 17 per cent of men and 15 per cent of women regarded their health as fairly poor or poor.

The differences between educational groups in self-rated health were clear and consistent among working-age men and women throughout the period under investigation. The lower the level of education, the poorer the self-rated health status (Figures 2a and 2b). These educational differences in perceived health have remained more or less unchanged or narrowed somewhat. The differences were greatest in the early 1980s, and since then began to decrease. Women with a primary and secondary education had better self-reported health during the recession in the early 1990s than before the recession, and the health inequalities narrowed momentarily. Among men, the health inequalities narrowed more sharply after the recession. The differences were at their narrowest in the late 1990s, since when they have again increased somewhat.

Figure 2a. Age-adjusted percentage of men aged 25–64 who rated their health as average or poorer in 1979–2004 (three-year moving averages) by length of education.

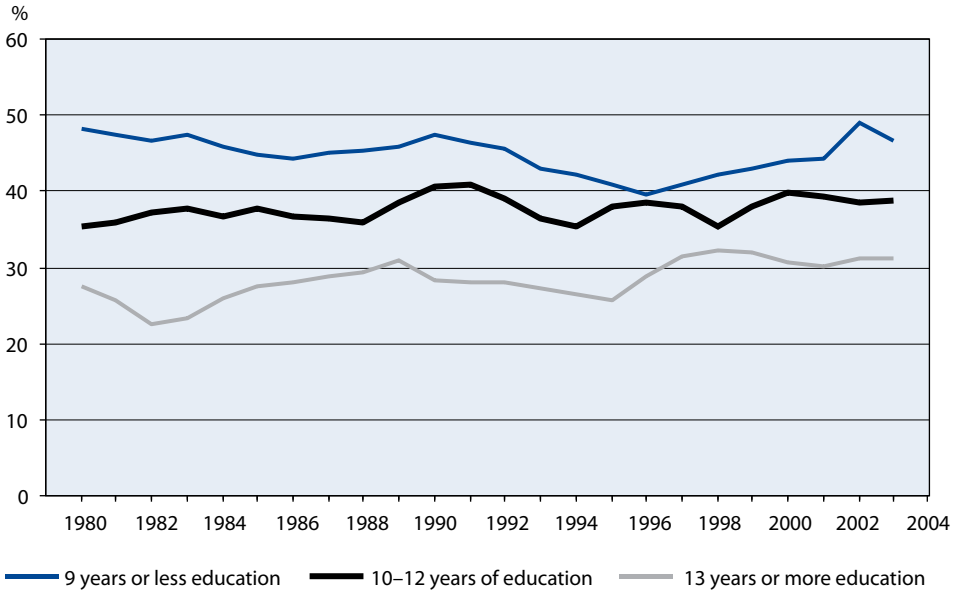


Figure 2b. Age-adjusted percentage of women aged 25-64 who rated their health as average or poorer in 1979–2004 (three-year moving averages) by length of education.

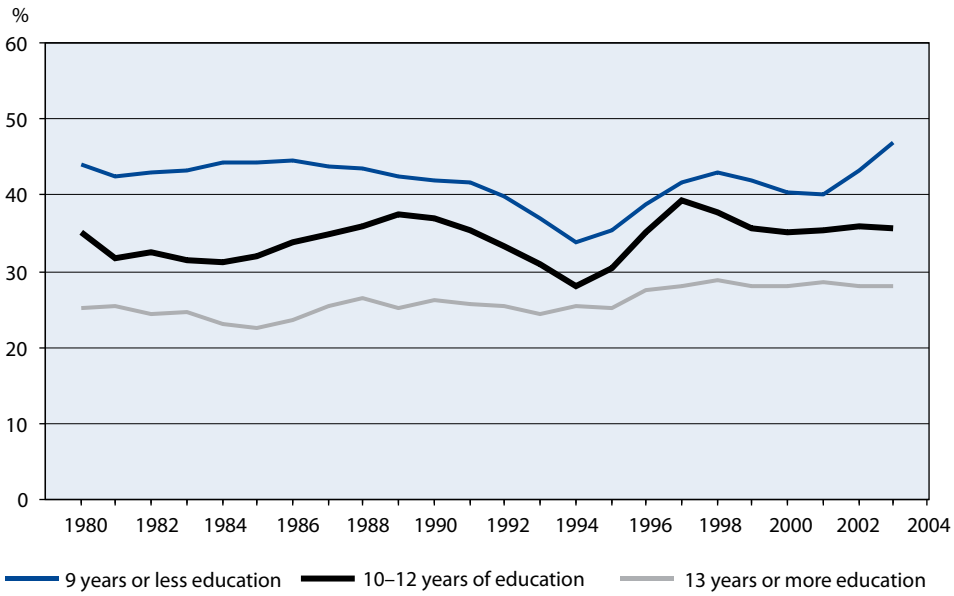
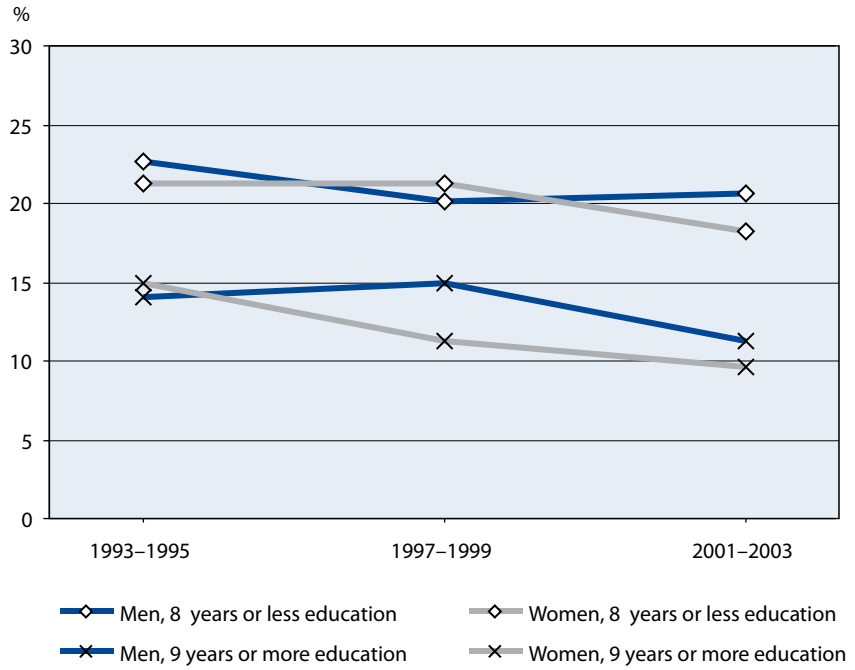


Figure 3. Age-adjusted percentage of men and women aged 65–84 who rated their health as fairly poor or poor in 1993–2003 by length of education.



In the elderly population, the educational differences in self-rated health have been wide and remained more or less unchanged throughout the ten-year period (Figure 3).

In the population of working age, there are also marked health differences by labour market status (Figures 4a and 4b). People who are in employment rate their health as better than the unemployed. Unemployed men were in better health towards the end of the recession than at the other points of measurement, and the differences by labour market position were at their narrowest at that time. Unemployed women also enjoyed better self-rated health during than before the recession, but the difference was not as clear as in the case of men. The health difference between the unemployed and employed population increased towards the end of the 1990s, and this difference has persisted in the 2000s.

Figure 4a. Age-adjusted percentage of men aged 25–64 who rated their health as average or poorer in 1979–2004 (three-year moving averages) by labour market status.

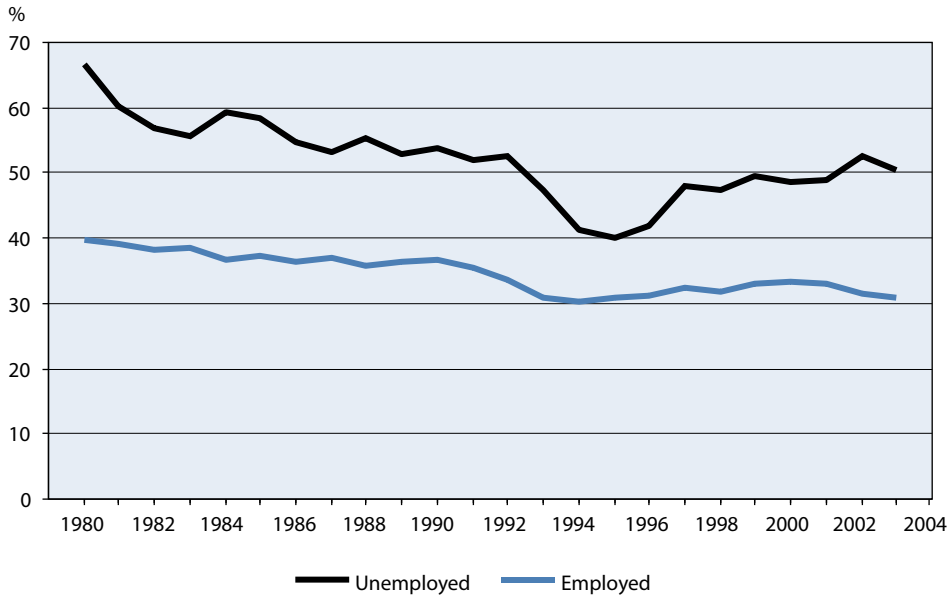
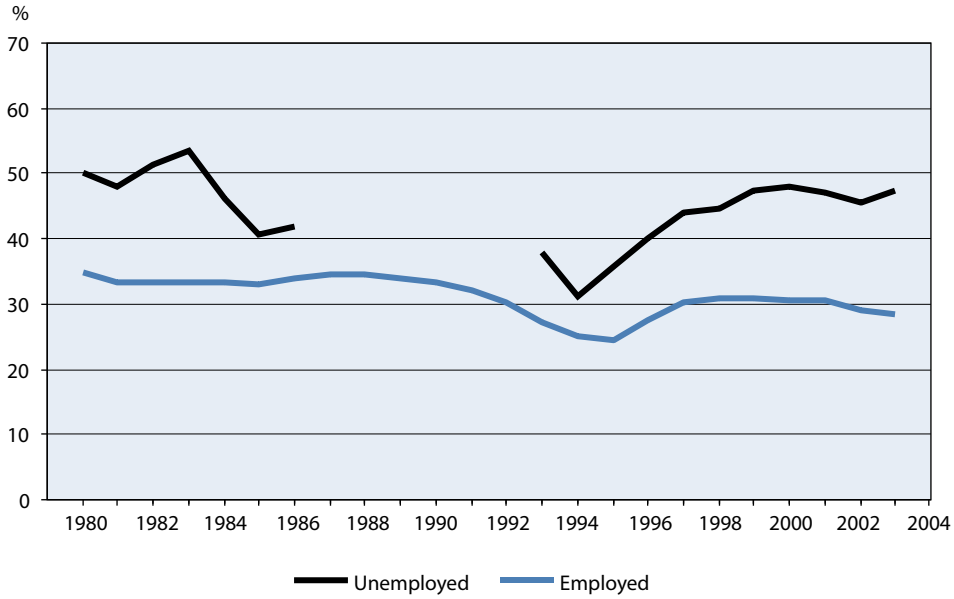


Figure 4b. Age-adjusted percentage of women aged 25–64 who rated their health as average or poorer in 1979–2004 (three-year moving averages) by labour market status (because of the small number of cases, figures for the unemployed are not shown for 1987–1992).



Educational differences in health persist, the health of the unemployed has deteriorated

In this section we have examined the development of self-rated health in Finland over a longer period of time than has hitherto been possible. Surveys that are repeated in the same format every year are well suited for this purpose and offer a reliable picture of the development of self-rated health. Measured in terms of self-report, the health of the working-age population improved in the 1980s and even more clearly during the recession. After the recession, the perceived health of women began to deteriorate, and in the early 2000s the health of both men and women has been more or less unchanged. Compared to the early 1980s, educational health differences have narrowed and a sharp decrease was seen during and immediately after the recession. Since the recession, the differences have started to grow again among working-age men, but remained unchanged among women. The health of the unemployed was better during than before the recession, but at the turn of the millennium it was at the same level as before the recession. The perceived health of people aged 65 or over improved from the early 1990s to the beginning of the 2000s. The educational differences in the self-rated health of older people have remained wide and continued to increase during the 2000s.

The recession had no immediate adverse effects on the self-rated health of the working-age population. The health differences by labour market status decreased during the recession, and educational differences narrowed among men soon after the recession; among women they remained at the same level as at the end of the 1980s. During the relatively strong employment situation in the 1980s, the health status of unemployed men was clearly poorer than that of employed men. During the period of mass unemployment in 1991–1994, the association between unemployment and health status was weaker. In these years unemployment was more evenly distributed than in the 1980s and the 2000s in the sense that it also affected people with a better education. During the recession, unemployment was also less selective by health status than during the economic upturn. Since the recession it has been more difficult for people in poorer health than those in good health to find a job.

In sum then, the recession did not adversely affect the population's self-rated health, nor did it increase educational differences in mortality (see Valkonen et al. 3.1 in this report) or self-rated health. Despite the cutbacks in social and health security during the recession, many basic structures of the welfare state remained intact, providing safety nets for the unemployed, for example (Heikkilä and Uusitalo 1997). This has probably helped to prevent marginalisa-

tion and the growth of health inequalities. Income differentials also decreased during the recession.

By the turn of the millennium, there has been a sea change in the situation of working-age people: their health is no longer improving, educational differences in health are unchanged, and the health of the unemployed is actually poorer than during the years of recession. The positive trends in health behaviour have also slowed in recent years, or even grounded to a halt (Helakorpi et al. 2005, see also chapter 4.1 in this report). The self-rated health of older people aged 65 or over has improved in the past ten years, but the educational differences in self-rated health remain high at the beginning of the 2000s.

No recent comparable studies are available from other countries. According to results from the mid-1990s, socio-economic health inequalities were greater in Finland than elsewhere in Europe on average (Lahelma et al. 2002, Kunst et al. 2005). These kinds of results go to show that it is indeed possible to reduce health inequalities in Finland.

However, there are some threats on the immediate horizon that may adversely impact the health of the population and widen rather than narrow health differences by education and labour market status. These threats have to do with the persistence of long-term unemployment, growing income differentials, alcohol policy decisions, rising food prices, and various other factors. In order to dispel these threats, it is necessary first of all to reduce long-term unemployment as well as income differentials. Furthermore, steps are needed to raise taxes on alcohol and to lower the price of healthy foods, such as domestic berries and fruit as well as low-fat and no-fat products. To reduce health inequalities in the future, it is important that more attention is given to preventing illness in the growing generations of children and to invest more heavily in such areas as child welfare clinics and school health care.

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3.3 Chronic morbidity

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Introduction

The prevalence of chronic diseases varies by socio-economic status almost as sharply as mortality and self-rated health, which were discussed in the previous sections. In the population of working age, the proportions reporting at least one chronic disease that impacts everyday life are more than twice as high for men and almost twice as high for women in the lowest educational and social groups than in the highest groups. The prevalence of chronic morbidity varies almost as widely between different income groups (Rahkonen and Lahelma 2002).

For example, the prevalence of many circulatory and respiratory diseases and musculoskeletal disorders is around 50–100 per cent higher among women and men with no more than primary education than among those with a higher degree (e.g. Martelin et al. 2004). Severe mental disorders are also most common in the lowest educational groups (see Ostamo et al. in this report). Socio-economic differences are particularly sharp in oral health: for instance, edentulousness is about five times more common in the lowest as compared to the highest educational group (Martelin et al. 2004). There are just a handful of diseases where these differences run in the opposite direction, i.e. where prevalences are higher in the highest social groups, but these so-called lifestyle diseases are exceptions to what is an otherwise very systematic pattern of socio-economic health inequalities.

The socio-economic differences in the prevalence of limiting long-standing illness in Finland are more or less comparable to those seen in the other Nordic countries (Lahelma et al. 2002). In some major disease categories, including nervous system, respiratory and skin diseases, socio-economic differences in Finland are at around the average for Western Europe (Dalstra et al. 2005). In the Nordic countries the socio-economic differences in chronic morbidity were more or less constant from the 1980s to the mid-1990s, but morbidity differences in Finland may have narrowed somewhat despite the economic recession of the early 1990s.

Only limited comparable data are available on the development of socio-economic differences in chronic morbidity. This section contains some pre-

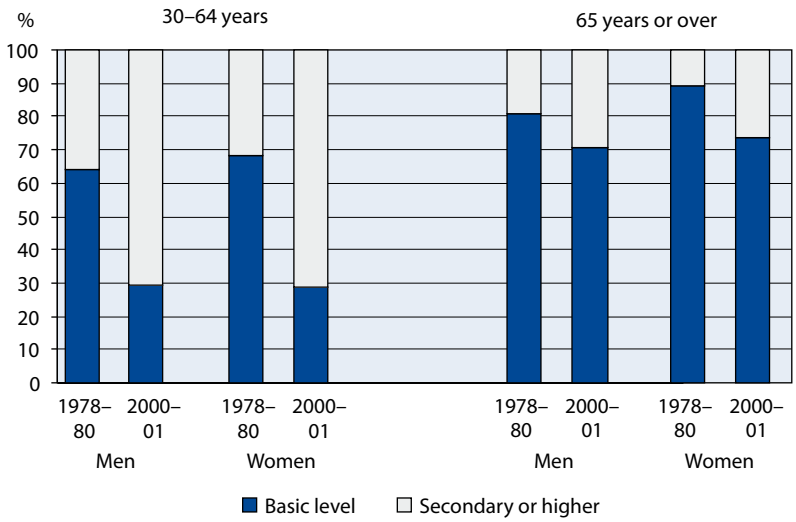
viously unpublished results on how the prevalence of chronic diseases has changed in the population aged 30 or over from the late 1970s to the early 2000s.

Material and methods

Mini-Finland and Health 2000 surveys

The figures presented here are drawn from the Mini-Finland Health Survey in 1978–1980 and the Health 2000 Examination Survey in 2000–2001. A general description of both these surveys is given in the Appendix. In both datasets, the participants were classified into two groups on the basis of questions concerning general and vocational education. There are some minor differences between the two sets of questions, but we have made every possible effort to create as comparable educational categories as possible. The basic education category (= lower educational group) was defined as consisting of those persons who had not taken the matriculation examination and who at most had completed a vocational course or received on-the-job training. Persons with a secondary education or higher (= higher educational group) had either more extensive vocational training (regardless of their basic education), or they had taken at least the matriculation examination.

Figure 1. Educational structure of the population (%) in 1978–1980 and 2000–2001, men and women aged 30–64 and 65 or over.



As is apparent from Figure 1, the educational structure of the population changed significantly during the two decades under investigation. Whereas in the late 1970s two-thirds of the population aged 30–64 were in the lower educational group, by the early 2000s the proportion had dropped to one-third. The educational level of the population aged 65 or over also increased significantly. Among women the change was even more pronounced than among men: at the end of the 1970s, no more than one in ten women aged 65 or over had a secondary education or higher, by the early 2000s the corresponding proportion was one in four.

Indicators of chronic morbidity

We have chosen to focus our discussion on indicators of major chronic diseases that we presume remain as comparable as possible, despite the changes that have happened over the past two decades in the definitions and diagnostic criteria of diseases, in health care practices and many other factors that impact admission to treatment and the detection of diseases.

As a general indicator of chronic morbidity, we use the proportion of respondents who in the interview reported at least one chronic disease, defect, condition or injury that they felt lowered their work ability or functional capacity.

The data on myocardial infarction and diabetes are based on the question: 'Have you ever been diagnosed with any of the following diseases?' The list of diseases following the question included 'myocardial infarction' and 'diabetes'. It has been shown that self-report is a reasonably reliable source for both these diseases (Heliövaara et al. 1993a).

The indicators chosen for respiratory diseases were the chronic bronchitis item, 'Have you had almost daily phlegm production for a total of at least three months during a year?' and a spirometry finding suggesting airway obstruction (FEV% < 70). Spirometry measurements are a highly reliable source on the prevalence of chronic obstructive pulmonary disease, and neither socioeconomic status nor timing factors can cause bias in educational group comparisons.

As for musculoskeletal diseases, our examination focuses on osteoarthritis of the knee and hip as well as on back and neck syndrome. These diseases have a major impact on the population's functional capacity and the need for treatment is high, and their prevalence showed a strong reverse correlation with level of education even in the Mini-Finland survey (Heliövaara et al. 1993b). The occurrence of musculoskeletal diseases and syndromes was assessed in a clinical examination on the basis of anamnesis of diseases, symptoms and clinical findings, using the same criteria in both the Mini-Finland and Health 2000 surveys (Riihimäki et al. 2004).

People who participate in population health surveys are generally healthier than those who do not (e.g. Jousilahti et al. 2005). High non-response may therefore distort the results, especially if the non-response rates vary widely between different population groups. In the Mini-Finland survey, participation rates were extremely high in both the interviews (96%) and the health examinations (90%), which means that any variation in non-response rates by educational group will not have had a significant impact, especially on the results concerning common diseases. In the Health 2000 survey, too, a very high proportion (89%) of the sample took part in the interviews, and there was no significant educational variation in participation rates (Koskinen et al. 2005). Therefore it is unlikely that these minor differences have distorted the prevalence rates obtained for myocardial infarction and diabetes in the Health 2000 survey. The health examination in the Health 2000 survey included spirometry measurements and a clinical examination by a doctor, and participation rates were around 80 per cent. As the people who took part in the health examination were, on average, in better health than those who didn't (e.g. Sainio et al. 2006, Laitinen et al. 2005), and as no analyses have been conducted to determine educational variation among non-participants, it is possible that non-response has caused some bias in the results concerning musculoskeletal disorders and obstructive pulmonary disease. In the Health 2000 survey, however, the occurrence of chronic bronchial coughing was also assessed in the health examination at home. Therefore, any bias caused by non-response will probably be lesser in this variable.

Statistical methods

Educational differences in the prevalence of chronic diseases and changes in these differences were investigated by logistic regression analysis. This was done using SUDAAN software, which allowed adjustments to be made to account for the sampling designs used in the Mini-Finland and Health 2000 surveys (Research Triangle Institute 2001). Differences between educational groups are described by reference to both age-adjusted prevalence rates and odds ratios (OR), in which case the comparisons are made in relation to the higher educational group (=1.00). The conclusion regarding the change in the difference between educational groups is based on the p value, indicating the statistical significance of the interaction of education and time of measurement. All results are shown separately for men and women, for the whole population aged 30 or over, and separately for people of working age (30–64) and for those aged 65 or over.

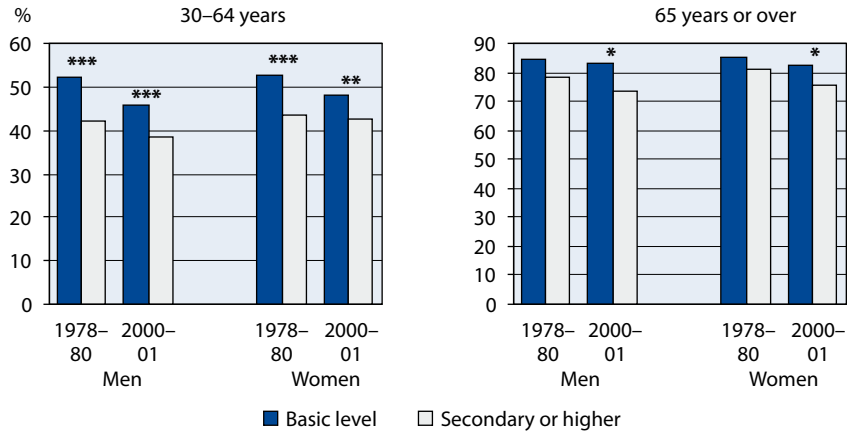
Chronic illness

Chronic morbidity has slightly decreased in both the working-age and the elderly population (Aromaa et al. 2002). Among middle-aged men and women with a basic education, over 50 per cent had at least one chronic illness in the late 1970s. Among those with a secondary education or higher, the proportion was significantly lower at just over 40 per cent. In the early 2000s, the proportion of people with a chronic illness had decreased in both educational groups, but the differences were still statistically significant (Figure 2).

In the early 2000s, more than 80 per cent of people aged 65 or over with a basic education reported at least one chronic illness, among those with a secondary education or higher the figure was just over 70 per cent. In both educational groups chronic morbidity decreased somewhat from the late 1970s to the early 2000s.

Among working-age women and men, the relative differences in chronic morbidity between educational groups decreased somewhat from the late 1970s to the early 2000s. Among people 65 or over, however, an opposite trend was seen: the relative differences increased somewhat. However, the changes were not statistically significant in either of the age groups (Table 1).

Figure 2. Age-adjusted percentage of men and women aged 30–64 and 65 or over reporting at least one chronic illness by level of education in 1978–1980 and 2000–2001.



*** difference between educational groups highly significant p<0.001
** difference between educational groups significant p<0.01
* difference between educational groups significant p<0.05

Table 1. Relative prevalence of certain common chronic diseases in the lower educational group as compared to the higher educational group (age-adjusted OR[1], higher educational group = 1.0) in 1987–1980 and 2000–2001 and statistical significance of change in educational difference between the two points of measurement.[2]

	Men			Women		
	1978–80 (OR)	2000–01 (OR)	Change 1978–80, 2000–01 (p)	1978-80 (OR)	2000-01 (OR)	Change 1978–80, 2000–01 (p)
30–64-years						
At least one chronic disease	**1.6*** **	**1.4*** **	0.331	**1.5*** **	**1.3** **	0.177
Myocardial infarction	**0.8**	**1.5**	**0.068**	**1.8**	**0.7**	0.212
Diabetes	**1.3**	**1.3**	0.822	**1.7**	**1.4**	0.620
Chronic bronchial cough	**1.7*** **	**1.8*** **	0.770	**1.4***	**1.8*** **	0.102
Bronchial obstruction (FEV% < 70)	**1.9** **	**1.1**	**0.055**	**1.9**	**1.5**	0.534
Osteoarthritis of the knee	**1.5**	**1.8***	0.572	**1.8*** **	**2.0** **	0.785
Osteoarthritis of the hip	**3.6** **	**1.9***	0.237	**1.4**	**1.6**	0.795
Neck syndrome	**1.8** **	**1.5**	0.565	**1.7*** **	**1.2**	0.137
Back syndrome	**1.5*** **	**1.6** **	0.750	**1.1**	**1.3**	0.234
65 years or over						
At least one chronic disease	**1.5**	**1.8***	0.677	**1.3**	**1.5***	0.552
Myocardial infarction	**1.1**	**1.7***	0.334	**1.0**	**1.1**	0.860
Diabetes	**2.2**	**1.6**	0.598	**1.2**	**1.8***	0.232
Chronic bronchial cough	**1.5**	**1.6**	0.725	**1.3**	**1.0**	0.490
Bronchial obstruction (FEV% < 70)	**1.5**	**2.6*** **	0.146	**1.2**	**1.1**	0.820
Osteoarthritis of the knee	**1.5**	**1.1**	0.429	**1.8** **	**1.3**	0.212
Osteoarthritis of the hip	**1.5**	**1.1**	0.480	**1.2**	**1.1**	0.778
Neck syndrome	**1.5**	**1.4**	0.824	**1.0**	**1.0**	0.896
Back syndrome	**1.1**	**1.4**	0.643	**1.0**	**0.8**	0.520
30 years or over						
At least one chronic disease	**1.6*** **	**1.5*** **	0.438	**1.6*** **	**1.3*** **	0.144
Myocardial infarction	**1.0**	**1.7** **	**0.038**	**1.4**	**1.2**	0.704
Diabetes	**1.7***	**1.3**	0.360	**1.6***	**1.5***	0.646
Chronic bronchial cough	**1.7*** **	**1.7*** **	0.928	**1.3***	**1.6*** **	0.330
Bronchial obstruction (FEV% < 70)	**1.8*** **	**1.5** **	0.360	**1.5***	**1.2**	0.390
Osteoarthritis of the knee	**1.7***	**1.5**	0.638	**2.0*** **	**1.7*** **	0.484
Osteoarthritis of the hip	**2.3** **	**1.5***	0.184	**1.4**	**1.4**	0.842
Neck syndrome	**1.9*** **	**1.7** **	0.661	**1.7*** **	**1.3**	0.166
Back syndrome	**1.5*** **	**1.6** **	0.772	**1.1**	**1.2**	0.592

[1] Odds ratio (OR) describes the relative prevalence of a disease in the lower educational group as compared to the higher educational group (=1.0). Statistical significance of the difference: *p<0.05 **p<0.01 ***p<0.001.

[2] Statistical significance of the interaction between educational group and point of measurement.

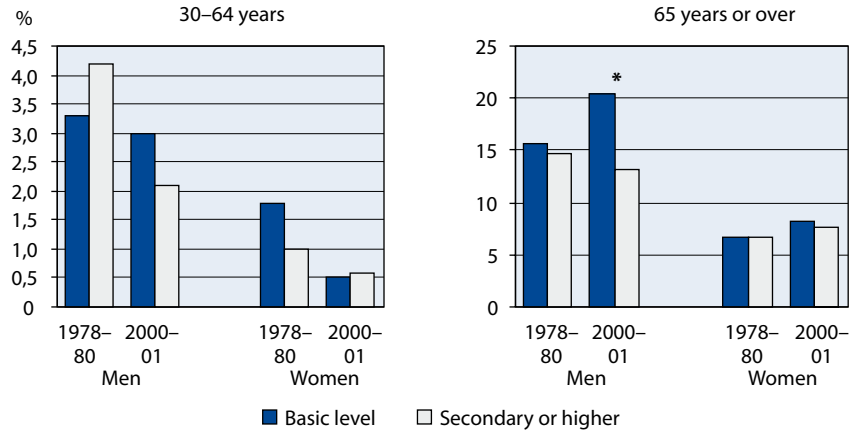
Coronary heart disease and diabetes

In the total population, the age-adjusted proportion of men who had suffered a myocardial infarction increased from 5.9 per cent to 6.8 per cent (Aromaa et al. 2002). This may be explained by more accurate diagnostic procedures and by the improved prognosis of the disease (Kattainen et al. 2004). Among women, no significant change was observed in the prevalence of self-reported myocardial infarction.

The proportion of men and women aged 30–64 who had experienced a myocardial infarction decreased significantly in both educational groups. Myocardial infarction was quite rare in the age group under 65 even in the late 1970s, and by the early 2000s only 0.5 per cent of women and 2.5 per cent of men reported having suffered a myocardial infarction (Figure 3). Therefore, in spite of the large size of the datasets, even the fairly large relative differences between the educational groups did not reach statistical significance in the working age population (Table 1).

In the elderly population aged 65 or over, the proportion of myocardial infarction sufferers increased in both educational groups of women and among men with a basic level of education, but decreased slightly among men in the higher educational group. In the late 1970s, the numbers aged 65 or over who had experienced a myocardial infarction were the same in both educational groups, and among women no differences were seen between the educational

Figure 3. Age-adjusted percentage of myocardial infarction sufferers aged 30–64 and 65 or over by educational level in 1978–1980 and 2000–2001.



* difference between educational groups significant p<0.05

groups in the early 2000s either. Among men aged 65 or over, on the other hand, myocardial infarction was far more common in the lower than the higher educational group in the early 2000s.

Among men then, educational differences in the prevalence of myocardial infarction increased in both the working-age and elderly population. When all men aged 30 or over are examined together, this change was statistically significant. A major reason why the educational differences among men have widened is no doubt that men in higher educational groups have more readily adopted lifestyles that are conducive to avoiding coronary heart disease. This assumption is supported by observations of differences in the level of risk factors for circulatory diseases and of how they have developed in different educational groups (see Reunanen et al. in this report).

Although CHD mortality has sharply decreased in all age groups (Kuolemansyyt 2004), the proportion of myocardial infarction sufferers increased in the elderly population from the late 1970s to the early 2000s (see also Kattainen et al. 2006). The reason for the increased prevalence of CHD especially among the oldest-old lies at least partly in improvements both in the treatment of acute myocardial infarction and in long-term treatments to prevent recurrence.

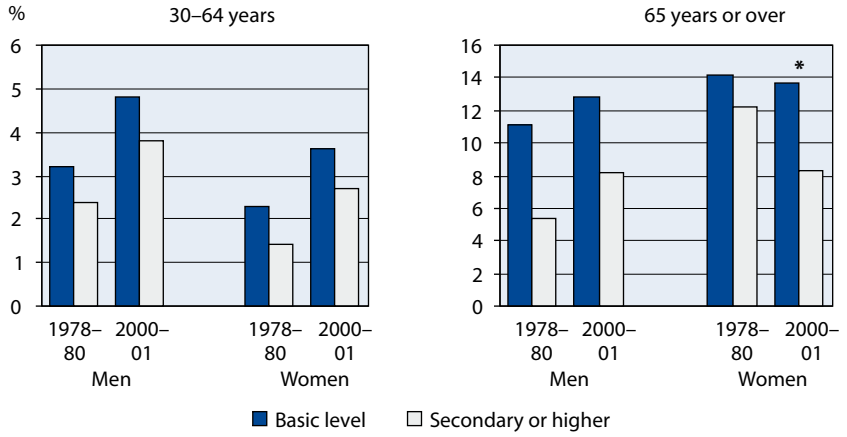
The prevalence of diabetes has been increasing in all age groups for several decades now (Reunanen 2006). Among working-age women and men and older men, the prevalence of diagnosed diabetes has increased at more or less the same rate in both educational groups. Among older women with a higher level of education, by contrast, it seems that the prevalence of diabetes has decreased, nor has the prevalence of diagnosed diabetes increased in the lower educational group of older women. This is consistent with results on trends in obesity, which show that the prevalence of obesity among women has not increased as rapidly as among men (Aromaa et al. 2002, Helakorpi et al. 2005). At both points of measurement the proportion of people with diabetes was higher in the lower educational group, and the difference between educational groups did not become statistically significant (Figure 4 and Table 1).

Respiratory diseases

Bronchial obstruction (FEV% < 70), as confirmed in respiratory function tests, is somewhat more common in the basic educational group than among people with a secondary or higher education. In the early 2000s, the educational differences were less pronounced among women and working-age men than among elderly men aged 65 or over. Bronchial obstruction was detected in almost one in three elderly men in the lower educational group; the prevalence in

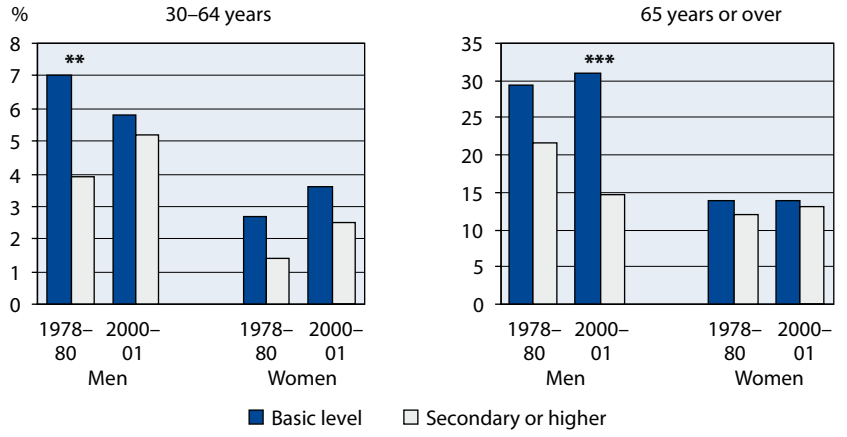
the higher educational group was just half of this. In the total population aged 30 or over, the differences between educational groups remained more or less unchanged (Figure 5 and Table 1).

Figure 4. Age-adjusted percentage of persons with diabetes aged 30–64 and 65 or over by level of education in 1978–1980 and 2000–2001.



* difference between educational groups significant p<0.05

Figure 5. Age-adjusted prevalence (%) of bronchial obstruction (FEV%<70) among persons aged 30–64 and 65 or over by level of education in 1978–1980 and 2000–2001.



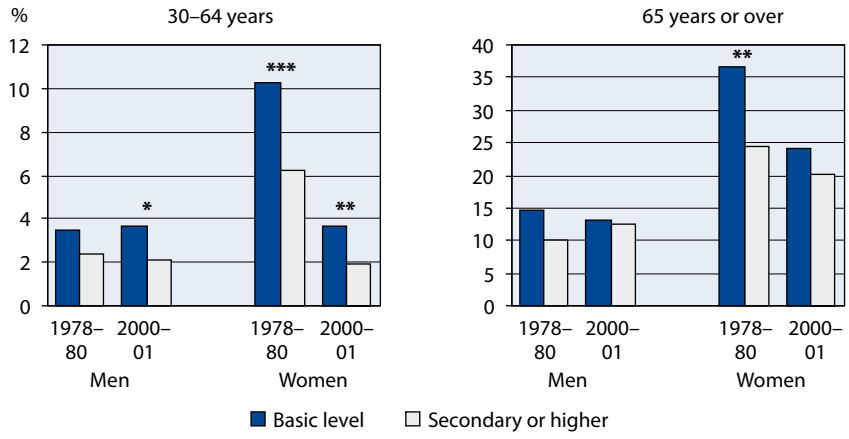
*** difference between educational groups highly significant p<0.001
** difference between educational groups significant p<0.01
* difference between educational groups significant p<0.05

Chronic bronchial coughing is also more common in the lower than higher educational groups, especially in the population of working age. The changes in the educational differences from the late 1970s to the early 2000s were not significant (Table 1).

Musculoskeletal diseases

The prevalence of osteoarthritis of the knee decreased significantly among both working-age and older women during the two decades, but the relative difference between educational groups seemed to narrow only among older women aged 65 or over. Among men, no marked change was seen in the prevalence of osteoarthritis of the knee, and the difference between educational groups remained marginal especially among older men (Figure 6 and Table 1). There was fairly sharp educational variation in the prevalence of hip osteoarthritis among working-age men, especially in the late 1970s, but among women and in the elderly population the differences were minor. Among men it seems that the difference between educational groups in the occurrence of hip osteoarthritis has decreased, but in the case of women, the minor difference remained unchanged over the two decades (Table 1).

Figure 6. Age-adjusted prevalence (%) of osteoarthritis of the knee in the age groups 30–64 and 65 or over by level of education in 1978–1980 and 2000–2001.



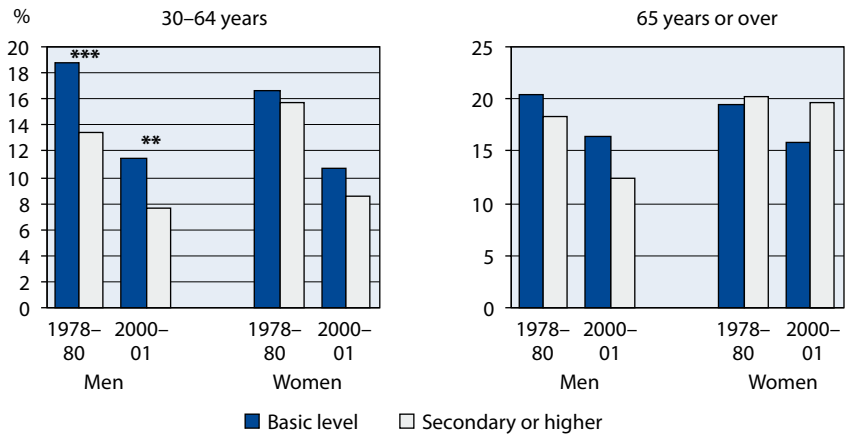
*** difference between educational groups highly significant p<0.001
** difference between educational groups significant p<0.01
* difference between educational groups significant p<0.05

The prevalence of back syndrome decreased from the late 1970s to the early 2000s particularly in the working-age population, and at roughly the same rate in different educational groups. Among working-age men, back syndrome was far more common in the lower than in the higher educational group at both points of measurement. Among working-age women and in the population aged 65 or over, no significant differences were observed between educational groups (Figure 7, Table 1). In working-age men and women, neck syndrome was much more common in the lower than in the higher educational group in the late 1970s, but this difference narrowed by the early 2000s. In the population aged 65 or over, there were only minor educational differences in neck pain at both points of measurement (Table 1).

Conclusions

Most chronic diseases are more prevalent in people with a basic education than in those with a secondary or higher education. In many diseases the relative differences between educational groups are more pronounced in the working-age than in the elderly population. Among men, there was only little educational variation in the occurrence of myocardial infarction in the late 1970s, but these differences increased considerably by the early 2000s as prevalence figures decreased more sharply in the higher educational group. Educational differences in the prevalence of other diseases changed only very little.

Figure 7. Age-adjusted prevalence (%) of back syndrome among men and women aged 30–64 and 65 or over by level of education in 1978–1980 and 2000–2001.



*** difference between educational groups highly significant p<0.001
** difference between educational groups significant p<0.01

Although educational differences in mortality have increased quite dramatically, no such tendency is evident in the prevalence of chronic diseases – with the single exception of myocardial infarction in men. This apparent contradiction may be explained by two factors. Firstly, many chronic diseases, including the most common musculoskeletal disorders, have no impact on the risk of death. For this reason it is false to assume that a sharpening of mortality differences automatically indicates a corresponding change in morbidity differences. Myocardial infarction increases the risk of death to a greater extent than the other diseases considered in this section, and indeed among men the changes in the prevalence of the disease in different educational groups have closely reflected the patterns seen in mortality (see Valkonen et al. in this report).

Another possible explanation for this apparent contradiction lies in the educational differences in the prognosis of diseases. If the prognosis improves (by virtue of more effective treatments, for instance) more quickly in higher socio-economic groups, then socio-economic mortality differences may widen even if there are no changes in the educational variation in the prevalence of the disease. The discussion by Manderbacka et al. later in this report (see section 4.3 below) on socio-economic differences in health service use and in the effectiveness of treatment, provides a useful backdrop to assess the viability of this explanation.

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3.4 Mental health

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Mental health disorders are responsible for more than one-fifth of all health-related disadvantages in western countries. Research has shown that in Finland, nearly one in four people suffer from some mental disorder. Even though mental health disorders are a major public health problem in Finland and the most common reason for early retirement (Pirkola and Sohlman 2005), there has been only limited research on socio-economic differences and on how these differences have changed. In particular, there is a great scarcity, both in Finland and elsewhere, of longitudinal studies exploring socio-economic differences in mental health and psychosocial well-being at different life stages. Most existing studies have focused on the prevalence of the disease, showing how common the disease is and how long it lasts. The key epidemiological phenomenon of incidence, by contrast, i.e. the transfer of individuals from the healthy to the diseased population, has received only scant attention in the mental health area. Comparisons between earlier results are complicated by the lack of methodological consistency in measuring both mental health and socio-economic status, as well as by changes over time in methods of examination and diagnosis. Reliable diagnosis usually requires clinical assessment, which is a laborious procedure in population surveys.

By way of a background to the discussions in this section, we start out with some theoretical and methodological observations that are relevant to studying socio-economic differences in mental health disorders. These are followed by an overview of the most important studies on mental health and, drawing on the existing research evidence, by a description of socio-economic differences in mental health among the population of working age, young people and the elderly, including an examination of any possible changes in these differences. Finally, we consider the causes of these differences and put forward some suggestions as to how socio-economic inequality in mental health could be reduced by means of health and social policy and interventions through the service system.

Socio-economic health inequalities have most commonly been explained from two directions: either by reference to social causes or by reference to selection (see e.g. Lahelma et al. in this report). According to the *social causes* explanation, the reason for mental health inequalities lies in the fact that people in lower social status positions have to endure more hardship, more problems

and more stress factors than average, all of which adversely affect their physical capacity and mental health. These stress factors have to do with material resources, social relations, the home environment, education, employment and working conditions. The impact of social status on mental health may also be mediated by lifestyle factors, such as alcohol use. In the *selection* explanation, then, mental health is not considered an outcome of social position and related resource and stress factors; on the contrary, mental health is seen as the major 'cause' of social status. It follows that people with mental health problems are drawn by selection into lower social positions, while strong mental health may help to create upward social mobility. The role of social causation and health selection in explaining mental health differences may differ in different types of disorders (Aro et al. 1995) and in different stages of life.

Two official coding systems of psychiatric diagnosis are currently in use in Finland: the ICD-10 classification (in use since 1996), which is based on the WHO International Classification of Diseases, and the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (the newest Finnish-language version of DSM-IV dates from 1997). The coding system that has gained the most acceptance worldwide is DSM-IV. In psychiatric classifications the overarching concept is that of mental disorders, of which mental illnesses or psychoses constitute only a small part (Lönnqvist et al. 2001). DSM-IV defines mental disorder as a clinically significant behavioural or psychological syndrome that is associated with present distress or disability or with a significantly increased risk of death, pain, disability, or an important loss of freedom.

In addition, clinicians and researchers in particular use various standardised scales to describe mental health. One of the most widely used tools is the General Health Questionnaire (GHQ), which assesses current psychological distress. The 12-item version (GHQ-12) provides a reliable measure of anxiety and depression in the population (Goldberg 1972, Pevalin 2000). The standardised Composite International Diagnostic Interview (CIDI) is used to identify possible mental health disorders (WHO 1997, Wittchen et al. 1998).

Research has shown that severe mental disorders in particular are unevenly distributed in the population: prevalence rates tend to increase in lower socio-economic groups (Dohrenwend et al. 1992, Holzer et al. 1986, Lehtinen et al. 1991, Regier et al. 1993). However, compared to other health problems, the associations between mental disorders and socio-economic status are less straightforward and partly different. The association may work in both directions and it may often be unclear. In addition, the size, direction and nature of socio-economic inequalities in mental health are different in different dis-

orders. Research in several countries has shown that severe mental disorders such as schizophrenia and serious depression are far more common in lower than higher social classes (Brown and Harris 1978, Kessler et al. 1994, Henderson et al. 1998, Lorant et al. 2003, Meltzer et al. 2003). In schizophrenic psychoses, low socio-economic status increases the relative risk of illness 2–3-fold and is associated with longer spells of illness, poorer care, poorer treatment results and disproportionate service use (Thornicroft 1991, Regier et al. 1993). Results on the associations between socio-economic status and less severe mental disorders, such as anxiety disorders and depressiveness, on the other hand, are somewhat contradictory. There is some evidence that they correlate with low social status (Lewis et al. 1998, Araya et al. 2003, Fryers et al. 2003), but it has also been reported that high socio-economic status is connected with poorer mental health (Stansfeld et al. 1992, Chandola et al. 2003).

In Finland, the nation's state of mental health can be traced in a few major population surveys, most recently the Health 2000 Survey by the National Public Health Institute (KTL) in 2000–2001 (Aromaa and Koskinen 2004). The Social Insurance Institution has conducted two significant research projects. In 1978–1980, the Mini-Finland survey collected a comprehensive population sample to explore the prevalence of major public health diseases and the related decline of work ability and need for care (Aromaa et al. 1989, Lehtinen et al. 1991). The first datasets for the UKKI project were collected in 1969–1972. Subsequently the development of the participants' mental health was followed for 16 years (Lehtinen 1975, Väisänen 1975, Lehtinen and Väisänen 1979, Lehtinen et al. 1993). Furthermore, there have been some epidemiological studies in Finland on suicides (Lönnqvist et al. 1993) as well as on the prevalence of mental disorders among health centre patients (Joukamaa et al. 1994, Karlsson et al. 2000), the elderly population (Mattila et al. 1989) and in the prison population (Joukamaa 1995).

Socio-economic differences in mental health in the working-age population

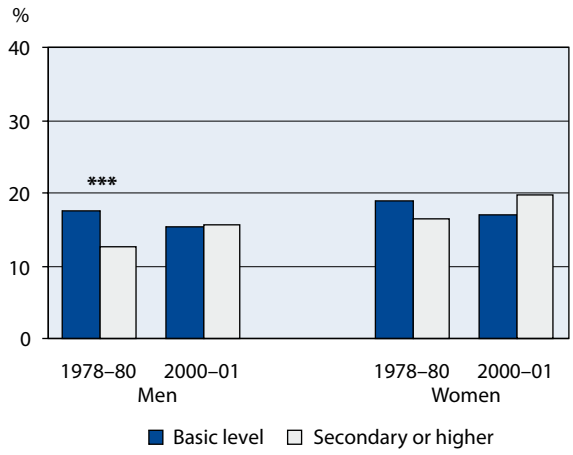
The Health 2000 survey used a variety of different methods to assess the mental health of Finland's population of working age (Pirkola et al. 2004 and 2005). Common mental disorders were measured with batteries of questions. CIDI interviews were conducted to identify any mental health disorders, and GHQ-12 was used to gain the participants' own assessments of their mental well-being. The preliminary results showed no educational differences in the occurrence of severe depression, alcohol dependence and mental symptoms (Martelin et

al. 2004, Pirkola et al. 2005). The participants' main activity, on the other hand, did emerge as a relevant factor in that especially among men aged 30 or over, unemployment predicted alcohol-related mental disorders, depression and anxiety (Pirkola et al 2005).

In the same survey, socio-economic differences in the prevalence of mental health problems among young adults (aged 18-29) were quite clear and striking. Among young women, mental distress and among both men and women, severe depression were about twice as common among those with a basic education than in other educational groups. Almost one-third (31%) of young women with a basic education had ever attempted to commit suicide, for all women of the same age the proportion was 4 per cent (Martelin et al. 2005).

In the Mini-Finland survey, the age-adjusted prevalence of all mental health disorders was 17.4 per cent (Lehtinen et al. 1991). Prevalence rates were higher among women than men. The prevalence of all psychiatric cases was clearly associated with social group. The difference between the highest and the intermediate social group was marginal, but in the lowest social group the prevalence rates were almost twice as high as in the other groups. The results for income quintiles showed a similar pattern: the lower the income quintile, the higher the prevalence of mental symptoms. Whereas in the lowest income quintile the proportion showing mental symptoms was two-fifths, in the highest income quintile the proportion was less than one-quarter. The results for educational level were again closely in line with the observations in the whole material: the lower the level of education, the higher the prevalence of symptoms.

Figure 1. Age-adjusted percentage of men and women aged 30–64 with mental symptoms (GHQ>3) by level of education in 1978–1980 and 2000–2001.



*** difference between educational groups statistically highly significant p<0.001

Source: Koskinen et al. 2004

Assessments based on the GHQ scale, however, indicate some change in the occurrence of mental symptoms in the population aged 30 or over when comparing the data of the Mini-Finland and Health 2000 surveys (Figure 1). At least among men, the former educational differences have evened out.

A study among middle-aged employees of the City of Helsinki found variable differences between different indicators of socio-economic status and common mental disorders (GHQ-12≥3). Low household income showed a weak positive association with mental disorders in women, but own level of education was irrelevant. The subject's low occupational status and low parental level of education even showed a slight reverse correlation with common mental disorders. This suggests that people with higher socio-economic status have a greater number of mild mental health problems. On the other hand, for women as well as for men, both childhood and current financial hardship showed a strong association with mental disorders (Lahelma et al. 2006).

In 1996, a population interview survey using the CIDI method (UM-CIDI Short Form) reported no educational differences in the prevalence of severe depression, but low income and unemployment emerged as risk factors for depression in both genders (Lindeman et al. 2000).

The lifetime prevalence of psychoses in Finland is over three per cent (Perälä et al. 2007). There are no major gender differences. Schizophrenia accounts for one-third of all psychoses. In the Mini-Finland survey 20 years earlier, schizophrenia and other psychoses tended to cluster in the lowest social group of men, whereas among women the correlation with social group was somewhat weaker (Lehtinen et al. 1991). The prevalence rates showed little difference between the highest and the middle social groups. Income, on the other hand, emerged as a significant factor in both men and women, and psychoses were most common in the lowest income groups. The UKKI project also found that psychoses were more common in the lowest social groups, and particularly among unmarried people and divorcees (Lehtinen and Väisänen 1979, Lehtinen et al. 1993). This association has been explained by suggesting that a severe mental disorder which usually develops at an early age may adversely affect occupational development, lead to work disability and hamper prospects of starting a family. The patient's social position declines within a few years of the onset of illness. The evidence suggests that people with schizophrenia are more liable to socio-economic decline than those with major affective disorders (Aro et al. 1995).

It is a reasonable assumption that the need for and use of mental health services reflect the prevalence of mental disorders in the population. In the Mini-Finland survey, both self-rated and clinically assessed need for care were

highest in the lowest social group, both among men and women (Lehtinen et al. 1991). A survey covering the period from 1991 to 1996 reported considerable educational differences in the use of psychiatric hospital services (Ostamo et al. 2005). Relative to the population, the number of hospital admissions attributable to psychiatric diagnoses was several times higher in people with the least education as compared to people with the highest level of education. During the six-year period under investigation, the educational differences increased.

Because of methodological differences, the results from the UKKI project are not directly comparable with other population surveys on mental health, but the data do nevertheless allow for some conclusions about demographic changes. In the five-year follow-up in the early 1970s, the relative number of both men and women classified as healthy in the two highest social groups was higher than at baseline, whereas in the two lowest groups the proportion of people with mental disorders had increased (Lehtinen and Väisänen 1979). The researchers presumed that either the social status of people with mental disorders had declined somewhat, or the social status of healthy people had improved. Sixteen years after the initial study, in 1985–1987, it was found that the lower the social position at baseline, the higher the proportion of men who had fallen ill (Lehtinen et al. 1993). Among women, no such association was seen. The proportion of those who had recovered was lowest among those whose social class had not changed and highest among those who had climbed to a higher social class. Indeed in their conclusions the researchers point to a tendency of polarisation: in the 1980s the population was being more and more clearly divided into those who had good mental health and those who were struggling to cope.

Based on a population-level survey of health services use in 1995–1996, the Social Insurance Institution reported a marked increase in the prevalence of mental symptoms as compared to the situation in 1987. In 1995–1996, low mood or depression, sense of weakness or fatigue and nervousness or tension were one and a half times more prevalent in the lowest income quintile as compared to others (Arinen et al. 1998). No variation by income quintile was observed in more abundant mental symptoms, i.e. the simultaneous occurrence of three symptoms, but the proportion of working-age men and women with symptoms had doubled from 1987 to 1995–1996.

In the annual KTL survey on Health Behaviour and Health among Finnish Adult Population (AVTK), respondents have been asked about experiences of stress. It seems that the proportion of both men (Figure 2) and women (Figure 3) experiencing stress (i.e. those who say they have experienced stress 'quite a lot more than people in general') has increased somewhat from 1979 to 2002.

Experiences of stress have been most common among people with the highest level of education and least common among those with the lowest level of education for almost 20 years. Since the recession of the early 1990s it seems that the prevalence of stress has increased more among men with the least education than among men with a secondary education. However, the prevalence of stress has increased most sharply of all among women with the least education, particularly around the turn of the millennium: according to these results women in this lowest educational group have turned from being the least stressed to the most stressed. If we narrow the focus to the 2–3 per cent of respondents reporting more serious stress ('My life situation is almost unbearable'), the educational differences were not very pronounced during the early part of the period under review, but in 1993–2002 people with the least education reported considerably more stress than other educational groups (based on Statistics Finland's classification of degrees; unpublished data).

Substance-related mental and behavioural disorders are common in Finland, and their prevalence has been on the increase in recent years. Studies on alcohol mortality are the most useful source on demographic breakdowns of disorders associated with alcohol and other substance abuse (Mäkelä 1999, Valkonen et al. in this report). There are marked socio-economic mortality differences both in alcohol poisonings and in alcohol-related diseases. Alcohol-related mortality increased in the late 1990s and impacted the life expectancy of blue-collar workers more than it did the life expectancy of white-collar workers (Valkonen et al. in this report). A study using materials on patients hospitalised in 1991–1996 with a psychiatric diagnosis revealed significant educational differences in the use of psychiatric hospital services for the treatment of substance-related mental disorders (Ostamo et al. 1995). The association between number of years in education and psychiatric disorders was linear, and the significance of education increased during the six-year period reviewed.

All in all, it seems that the prevalence of severe mental disorders is at roughly the same level as 20 years ago, and the research consistently indicates that these severe disorders are associated with a lower social status. Mental symptoms and experiences of stress seem to have increased to some extent in the working-age population over the past couple of decades. The associations of these less severe mental health problems with socio-economic status are not as clear and straightforward as in the case of severe disorders, and indeed some of them are in the opposite direction.

Figure 2. Age-adjusted percentage of men aged 25–64 with experiences of stress by number of years in education, 1979–2002 (AVTK).

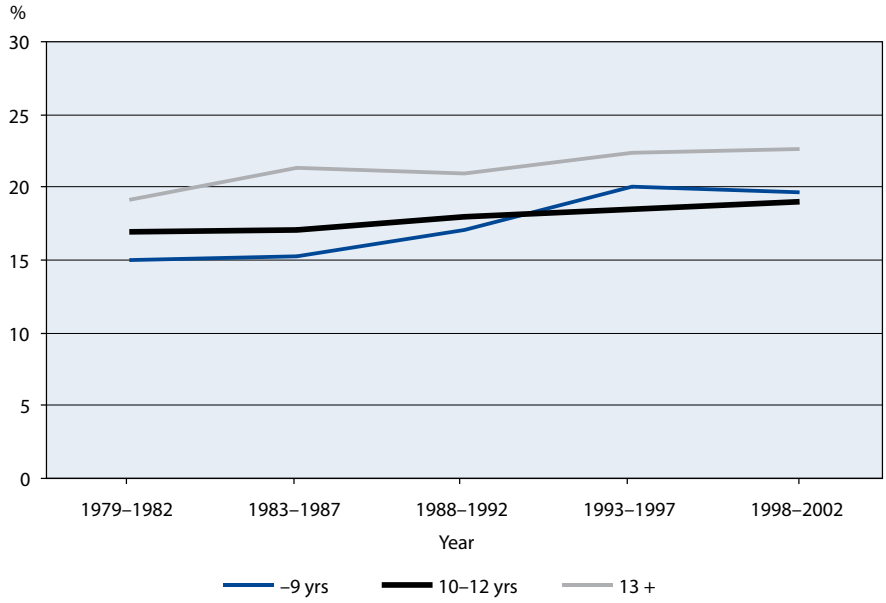
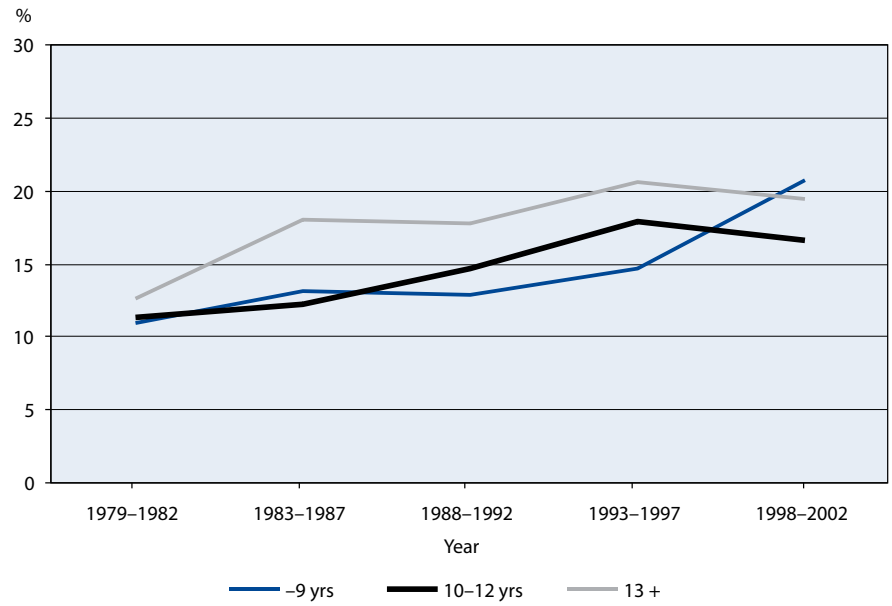


Figure 3. Age-adjusted percentage of women aged 25–64 with experiences of stress by number of years in education, 1979–2002 (AVTK).



Socio-economic differences in mental health among young people

There is relatively little population-level research on socio-economic differences in the well-being of young people. Some studies have reported that these differences are generally less pronounced in youth than in childhood and adulthood, both as regards mental and somatic health. It has been suggested that the low level of differences is due in part to the growing equalizing influence of school, peer group and youth culture in adolescence. On the other hand, it has been pointed out that there is always a time lag between circumstances that are damaging to health and the actual occurrence of illness. Other factors that may confound the association include bias in subject selection and difficulties in defining the class position of young people (West 1997).

Many mental disorders start in adolescence. The prevalence of mental disorders in young people is twice as high as in children and at roughly the same level as in adults. In particular, mood disorders tend to increase during adolescence. In epidemiological surveys among young people, the proportions suffering from some mental disorder have generally been around 15–25 per cent (Marttunen and Rantanen 2001). There are some indications that mental disorders in children and young people have increased (Tamminen and Räsänen 2004).

Very little is known about social class differences in mental disorders among young people. In the 1980s and 1990s, the occurrence of less severe symptoms has been found to differ only very little or not at all by parental socio-economic status (Eriksson et al. 1992, Koivusilta et al. 2004). Psychosomatic symptoms appear to be somewhat more common among girls from blue-collar backgrounds (Huurre et al. 2003a), or girls whose mothers have a low level of education and who have felt the family is financially constrained (Välimaa 2000). Among boys, frequent (at least weekly) occurrence of symptoms is associated with poor perceived family financial situation (Välimaa 2000). Depressive symptoms in both boys and girls have been found to be associated with family financial hardship (Fröjd et al. 2006).

Although the evidence suggests that there were only relatively minor differences in the occurrence of symptoms by parental socio-economic status in the 1980s and the 1990s, it has been shown that young people's family background and parental socio-economic status impact a number of factors associated with schooling and the formation of social status (e.g. Savolainen 2001, Kauppinen 2004), which in turn may increase and exacerbate mental health problems. Several studies have found that poor school achievement, short educational career, dropout from education and educational marginalisation are associated with

mental health symptoms and problems (Aro et al. 1987, Rintanen 2000, Välimaa 2000, Koivusilta et al. 2004, Huurre et al. 2003b). Furthermore, it has been reported that various problems with schooling may increase the risk of mental disorder later in life (Isohanni 2000). Problems with mental health in childhood and adolescence may for their part adversely affect schooling and educational career (Rintanen 2000, Isohanni 2000, Huurre et al. 2005).

It has been reported that parental social status is associated with young people's lifestyle and health habits (Karvonen and Rahkonen 2000, Huurre et al. 2003b, Fröjd et al. 2006). Adverse health habits, for their part, are associated with young people's mental health and school attendance (Rimpelä et al. 1982, Rantakallio 1983) as well as with health and socio-economic position in adulthood (Isohanni 2000, Koivusilta et al. 2004).

In sum, then, socio-economic differences in mental health among young people begin to appear at the stage where they leave their family home and start building their own life. In this process, factors related to schooling and education play a critical part. Difficulties at school may add to mental health problems, which in turn may adversely affect schooling. These factors contribute to inequalities in well-being even in adulthood.

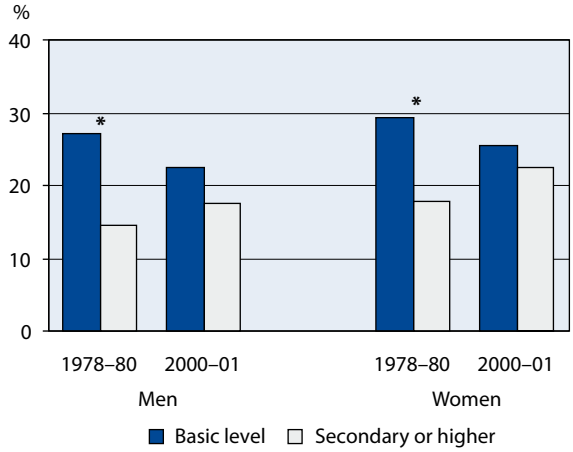
Socio-economic differences in mental health among the elderly

Mental disorders are common in older people, but not as common as among the middle-aged. Research figures indicate that 16–30 per cent of people aged over 60 suffer from some mental disorder (Koponen and Leinonen 2001). In addition to common mental disorders, older people can often have mental symptoms associated with organic diseases. There is a striking dearth of research on socio-economic differences in mental health among the elderly.

According to results from the Mini-Finland and Health 2000 surveys, it seems that educational differences in the occurrence of mental symptoms among people aged 65 or over have slightly evened out over the past 20 years (Figure 4). However, in contrast to the situation in the population of working age, the prevalence of symptoms continues to remain higher among people with less education than among those with more education.

Using structured interviews and questionnaires to follow-up associations between retirement and mental and physical well-being at four-year intervals from 1982, the Turva project among persons aged 61 found that retirement was not a particularly stressful life event; in fact in many cases quite the opposite was true. Poor financial situation, on the other hand, coupled with many other factors, was clearly associated with GHQ scores of mental health (Mattila et al. 1989).

Figure 4. Age-adjusted percentage of persons aged 65 or over with mental symptoms (GHQ>3) by education in 1978–1980 and 2000–2001.



*difference between educational groups statistically significant p<0.05

Source: Koskinen et al. 2004

Conclusions

The mental health of the population has remained more or less unchanged over the past 20 years, when assessed in terms of diagnosed mental disorders. At the same time, there have been marked changes in both the supply and use of mental health services. If statistics on the use of psychiatric hospital services are considered to reflect the need for hospital care, that was greatest and increased most sharply in the lowest educational group in virtually all categories of mental disorders in the early 1990s. There is no firm and conclusive evidence that socio-economic inequalities in mental health have increased over the past years, but it seems that the inequalities observed at least continue to prevail.

Some of the factors that are associated with the population's mental health may indeed be risk factors proper, but others may just as well be consequences of mental health disorders. In the absence of systematic longitudinal studies on the epidemiology of mental health, our descriptions of socio-economic inequalities in mental health and particularly of how they have changed over time, are bound to remain rather shallow and their evidence indirect and inconclusive.

If we are serious about the goal of promoting the population's mental health and about reducing and preventing socio-economic inequalities in mental health, the first step is to raise awareness and stimulate public debate on mental

health issues. Key areas that must be covered include attitudes towards mental health; public perceptions of psychiatry and mental health services; the appeal of mental health work; the adequacy of professional training given; the social and mental problems engendered by the current pace of change in society; and questions of cooperation and responsibility in mental health services.

The major underlying causes of inequalities in mental health are largely the same as the causes of other socio-economic health inequalities. They include early and current social and economic living conditions, health behaviours, and the balance of demand and supply in health service provision. There is strong evidence that inadequate living conditions in childhood and current financial difficulties predict mental health problems. It has been reported that socio-economic inequalities in mental health are greater in early adulthood and adulthood than in adolescence. Factors related to schooling and education seem particularly important in the development of socio-economic inequalities in mental health among young people. A mental disorder that has its onset at an early age may hamper occupational development and lead to work disability and marginalisation. High-risk groups include children and young people from deprived backgrounds who do not have access to enough support from home for learning. Therefore, a key focus in the prevention of socio-economic health inequalities should be placed on the critical transition from adolescence to early adulthood.

Heikkilä (1990) has pointed out that because of their high mental stress load, welfare clients who are on income support constitute a mental health risk group. Mannila and Peltoniemi (1997) found that in both the 1980s and 1990s, people with long-term mental health problems were the most marginalised groups among people in poor health, as measured on all conventional dimensions of marginalisation. They were not in the position to ascertain whether mental health problems were the causes of marginalisation, or whether marginalisation had caused their mental health problems. In any event it is clear that the accumulation of social marginalisation in connection with poor mental health is acting to maintain mental health inequalities in the population – whatever the underlying mechanism (Mannila 2002). People with psychoses and other severe mental disorders have a large number of physical illnesses and symptoms, too, pointing at evidence that this group of patients are neglecting their physical health (Suvisaari et al. 2007). These people need and deserve not only good psychiatric care, but also appropriate somatic care.

The maintenance of good mental health in all population groups requires continuous follow-up and a continuous flow of research data on how possible health inequalities develop and on what consequences these inequalities have.

A change of attitude is needed in the public debate on mental health disorders so that they are seen and accepted as an integral part of other health problems. In order to break the intergenerational transfer of mental health disorders and marginalisation, measures aimed at the prevention of marginalisation should cut across the individual's entire life cycle. In particular, the children of people with mental illness, those with an illness that had its onset in adolescence, school dropouts and the unemployed need a tighter network of social support. All patient treatment plans should take special account of the goal of preventing the inequality that comes with mental illness. It is crucial that greater awareness is fostered of the importance of good mental health to Finnish society as a whole, and that the vulnerability of mental health patients is given special consideration when resources are allocated to the service system.

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3.5 Functional capacity

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Public health in Finland has, by and large, developed favourably over the last couple of decades. At the same time, functional capacity in the population has continued to improve: ever smaller proportions are experiencing difficulties with mobility, daily chores, and self and household care (Aromaa and Koskinen 2004a). Nevertheless various functional limitations remain a significant problem for older people in particular, and even in the working-age population it is possible to see indications of functional difficulties that adversely affect quality of life and work ability (Helakorpi et al. 2005, Aromaa and Koskinen 2004b, Kauppinen et al. 2004). The projected changes in the population structure emphasise the crucial importance of maintaining and improving functional capacity in all age groups (e.g. Martelin et al. 2004).

Functional limitations are not evenly distributed in the population. As on virtually all dimensions of health, research in different countries has documented systematic socio-economic differences in functional capacity as well (e.g. Deeg et al. 1992, Stuck et al. 1999, Guralnik et al. 1993, Rahkonen and Takala 1997, Grundy and Glaser 2000, Broese van Groenou et al. 2003, Huisman et al. 2003, Beydoun and Popkin 2005, Rautio et al. 2005). This is only to be expected, as medical health condition is a key determinant of functional capacity. Apart from medical health, functional capacity is influenced by various other individual and environmental characteristics, such as housing conditions and service availability (International Classification of Functioning, Disability and Health, 2001). An understanding of how functional capacity differs between socio-economic groups is especially useful in the search for ways in which to improve functional capacity in the population. For instance, the identification of population groups who are most at risk of loss of functional capacity is vital for the appropriate targeting of early rehabilitation. A basic description of disparities in functional capacity also provides a solid foundation for further studies aimed at explaining the most crucial differences in public health terms and at promoting efforts to reduce those differences. In addition, an examination of functional capacity in different population groups may offer valuable clues for setting concrete targets and objectives. One example of such target-setting is the goal of bringing the whole population to the level currently attained by the most advantaged groups.

This section describes the magnitude of socio-economic differences on various dimensions of functional capacity and how they have changed over the last 10–20 years. Socio-economic position is measured by reference to education.

The concept of functional capacity and how it is measured

The concept of functional capacity can be analysed by using different models. According to the International Classification of Functioning, Disability and Health (ICF; 2001), functional capacity consists of body functions and structure, activities and participation. Functional capacity is considered to interact with health and various individual and environmental factors. The ICF classification shares many features in common with the sociomedical disablement process model advanced by Verbrugge and Jette (1994). This model describes the development of functional limitations as a process where in the first stage, illnesses and injuries cause impairments to the structure and function of organ systems. These impairments, then, cause functional limitations, i.e. problems in physical and mental functions such as mobility or sensory and cognitive functions. These limitations, in turn, may lead to disabilities, making it difficult to manage daily activities, to participate and to have social interaction. The development of functional disabilities may be accelerated or retarded by various individual and environmental factors.

The following description of socio-economic differences in functional capacity loosely follows this model, proceeding from functional limitations to limitations in activities of daily living and in participation. We begin with a discussion of limitations in *mobility,* which are central to the development of other functional limitations, and then move on to limitations in *sensory* and *cognitive functions*. This is followed by a description of socio-economic differences in limitations in *activities of daily living*, and finally by observations on differences in *social functioning* and *work ability*.

Datasets and classification of education

This examination is based on materials from several nationally representative surveys and their research reports. One of these surveys is the Health 2000 survey, conducted by the National Public Health Institute (KTL) along with several partners in cooperation in 2000–2001 in the Finnish population aged 18 or over (Aromaa and Koskinen 2004b, Koskinen et al. 2005). The results from this survey for the population aged 30 or over can be compared with the Mini-Finland Health Survey 20 years earlier by the Social Insurance Institu-

tion (Aromaa et al. 1989). Our second major source consists of the surveys on health behaviour and health among the Finnish adult population (AVTK) that have been conducted annually by the KTL since 1978 in the population aged 15–64 (e.g. Helakorpi et al. 2005), as well as the corresponding surveys among the population aged 65 or over (EVTK), which are conducted every other year (e.g. Sulander et al. 2006a). Our fourth source consists of the Work and Health interview studies by the Institute of Occupational Health in 1997, 2000 and 2003 (e.g. Kauppinen et al. 2004).

These different sources have used different classifications of education. In our comparisons over time between the Health 2000 and Mini-Finland surveys, the respondents are divided into two groups based on questions concerning basic and vocational education (even though the initial variables were different) in order to form as similar groups as possible. The basic education category (= lower educational group) was defined as consisting of those persons who had not taken the matriculation examination and who at best had completed a vocational course or received on-the-job training. Persons with a secondary education or higher (= higher educational group) had either more extensive vocational training (regardless of their basic education), or they had taken at least the matriculation examination. In the health behaviour surveys among the adult and elderly populations (AVTK and EVTK, respectively), level of education is determined according to the question concerning number of years in education. Descriptions of the working-age population use an indicator of relative education, i.e. the respondents are classified into the lowest, intermediate and highest educational group based on the breakdown of number of years in education for each birth cohort. In the analyses of the elderly population aged 65 or over, two educational categories are used: 8 years or less and 9 years or more education. Examinations of work ability based on the Work and Health interviews also use a two-tiered classification of education: the lower group includes those who have completed elementary or comprehensive school and no more than vocational school, the higher group includes those who have completed at least grammar school or vocational college.

Mobility

Mobility is an important aspect of functional capacity; any problems with mobility are reflected in many areas of everyday life. Mobility problems make it difficult to take part in everyday chores and leisure activities and therefore adversely affect quality of life. Severe mobility restrictions increase the need for outside help and in this way jeopardise an active and independent life. Mobility

can be described by reference to the ability to walk various distances or to negotiate stairs, for example. These assessments can be made either on the basis of self-report or test measurements.

Mobility problems increase considerably with advancing age. Among young adults (18–29 years) only a couple of per cent and in the age group 30–64 years 7 per cent have difficulties walking a distance of two kilometres, in the elderly population almost one-half report difficulties (Sainio et al. 2005, Sainio et al. 2006). In the past few decades the prevalence of mobility problems has greatly decreased in both the working-age and elderly population, with the possible exception of the oldest-old age groups (Aromaa and Koskinen 2004a, Martelin et al. 2004).

Educational differences

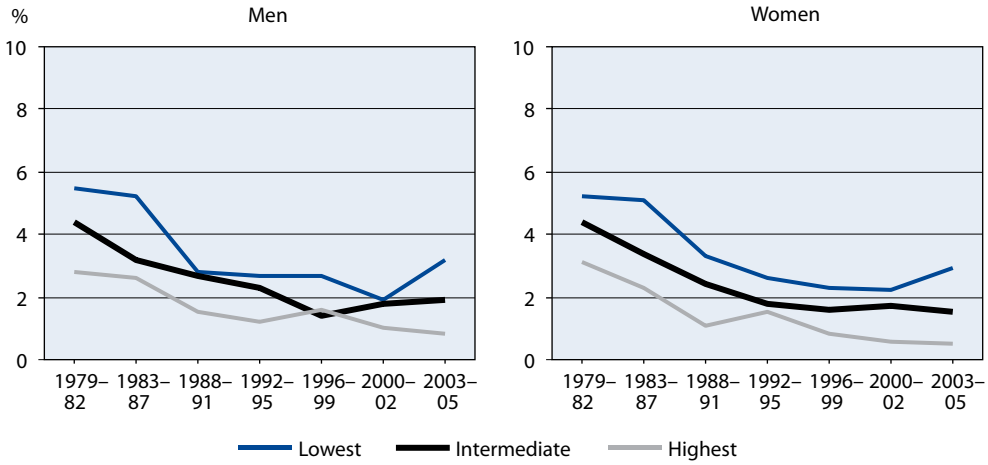
Analyses based on extensive population surveys consistently indicate that mobility difficulties are more common in lower than in higher educational groups (Sainio et al. 2005, Sulander et al. 2006a, Helakorpi et al. 2005, Sainio et al. 2007). The differences are visible even in young adults and are very pronounced in the working-age and elderly population.

Less information is available on how educational differences have changed over time. A comparison of the results from the Health 2000 survey and the Mini-Finland survey in 1978–1980 shows that educational differences in walking difficulties, for instance, have remained unchanged (Tables 1 and 2). No changes were observed in educational differences in the age group 65–74, either, when the Mini-Finland results were compared with those from the FINRISK-97 Senior Survey (Martelin et al. 2002). Figure 1 illustrates the changes in walking difficulties in educational groups for the working-age population in 1979–2005, and Figure 2 the corresponding changes for the elderly population in 1993–2003. Mobility difficulties have decreased rather evenly across all educational groups.

Causes of educational differences

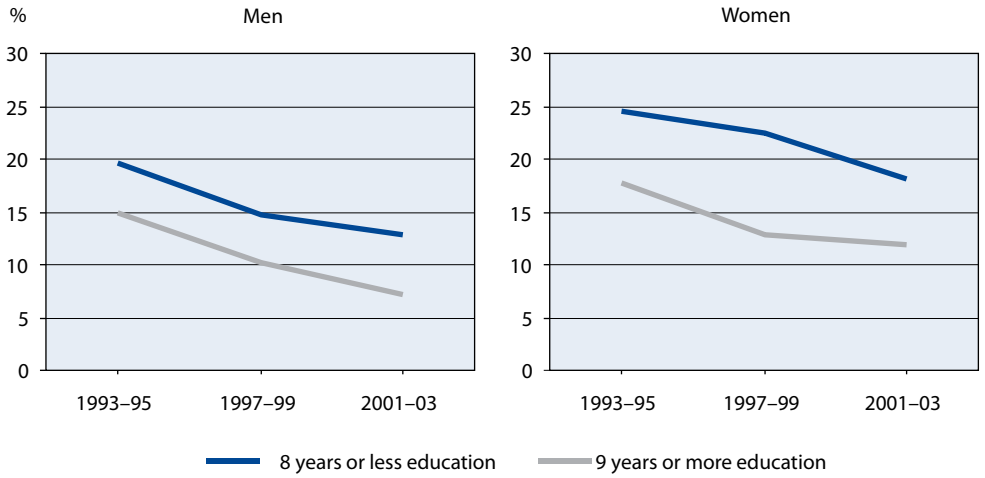
The socio-economic differences observed in mobility may be due to a number of different factors that are unevenly distributed by education. These include, for example, illnesses, health behaviour, physical work stress and psychosocial factors. The results on the role of different factors are inconsistent; on the other hand there are only relatively few reliable studies based on representative datasets. The Health 2000 survey looked at factors that might explain educational

Figure 1. Age-adjusted percentage of men and women aged 25–64 not capable of walking a distance of 500 metres by educational group in 1979–2005.[1]



[1]Source: AVTK.

Figure 2. Age-adjusted percentage of men and women aged 65–84 experiencing difficulties in outdoor mobility by educational group in 1993–2003.[1]



[1]Source: EVTK.

differences in negotiating stairs in the population aged 55 or over (Sainio et al. 2007). The differences disappeared or at least were clearly reduced when obesity, smoking, physical work stress and chronic illnesses were controlled for. Among men, diabetes, physical work stress, musculoskeletal diseases, obesity and smoking emerged as important explanatory factors for educational differ-

ences in mobility limitations. Among women, the single most significant explanatory factor was obesity; physical work stress, knee and hip arthrosis and circulatory diseases also emerged as important factors. A low level of education is therefore not a 'cause' of mobility difficulties, but there are differences between educational groups related to living conditions, work, physical stress and diseases that are also reflected in mobility.

Sensory and cognitive functions

The following discusses the prevalence of vision and hearing difficulties in the population aged 30 or over by education in the late 1970s (Mini-Finland survey) and early 2000s (Health 2000). In addition, Health 2000 results are presented for measurements of visual acuity, hearing threshold and cognitive functioning by educational group.

Vision

In the early 2000s, 4 per cent of the Finnish population of working age and almost one in six persons aged 65 or over had difficulties reading newspapers because of poor eyesight. The prevalence of these difficulties was reduced by one-half compared to the situation in the late 1970s. Among working-age men, the situation improved at more or less the same pace in all educational groups, and at both points of measurement eyesight problems were almost three times more common in the lower than in the higher educational group (Table 1). Among working-age women, on the other hand, problems with vision decreased more sharply in the lower than the higher educational group, and educational differences narrowed but still remained statistically significant.

In the elderly population, too, difficulties with reading a newspaper are more common in the lowest educational group (Table 2). Difficulties have decreased among both men and women in all educational categories, and there have been no significant changes in the educational differences.

In Health 2000, objective test results confirmed that reduced visual acuity was least common in the highest educational group among both women and men, but these differences were quite minor and they were not statistically significant (Table 3).

Table 1. Prevalence of perceived functional limitations by educational group[1] (%, age-adjusted), their relative prevalence in the lower educational group as compared to the higher educational group (age-adjusted OR[2], higher educational group = 1.0) in 1978–1980 and 2000–2001, and the statistical significance[3] of the change in educational difference between the two points of measurement, in the population aged 30–64 by gender.

	Prevalence of limitation 1978–80			Prevalence of limitation 2000–01			Change in difference 1978–2000 (p) [3]
	Higher educational group (%)	Lower educational group (%)	OR [2]	Higher educational group (%)	Lower educational group (%)	OR [2]	
MOBILITY							
Moving about at home							
- men	0.8	2.8	3.9**	0.5	1.1	2.2	0.404
- women	1.6	2.8	1.8	0.5	0.8	1.6	0.849
Walking 500 m							
- men	3.4	7.1	2.2***	2.4	5.5	2.5***	0.710
- women	4.4	7.6	1.8**	2.5	4.5	1.8*	0.980
Climbing stairs (measured)							
- men	3.3	5.2	1.6*	1.2	3.6	3.1*	0.241
- women	4.3	7.5	1.9*	2.2	3.8	1.8	0.956
Carrying a shopping bag							
- men	4.7	8.1	1.8*	2.5	4.8	2.0**	0.795
- women	10.8	15.4	1.6**	8.9	10.4	1.2	0.200
SENSORY FUNCTIONS							
Reading a newspaper							
- men	4.4	11.7	2.9***	2.4	6.6	2.9***	0.972
- women	3.8	13.0	3.8***	2.9	5.9	2.1***	0.035
Hearing a discussion							
- men	10.0	15.8	1.7***	10.3	13.7	1.4**	0.240
- women	6.9	11.1	1.7***	7.7	9.3	1.2	0.095
ACTIVITIES OF DAILY LIVING							
Dressing and undressing							
- men	1.4	4.6	3.4***	1.6	3.1	2.0*	0.207
- women	2.0	4.2	2.2*	2.5	3.9	1.6	0.469
Cutting toenails							
- men	2.3	6.9	3.3***	2.8	5.7	2.2***	0.212
- women	3.6	7.7	2.3**	3.4	5.6	1.8**	0.373
SOCIAL FUNCTIONING AND WORK ABILITY							
Taking care of matters together with other people							
- men	8.9	19.4	2.5***	1.9	4.4	2.4***	0.966
- women	9.1	18.5	2.3***	1.4	3.9	2.8***	0.448
Perceived work ability							
- men	15.6	27.7	2.3***	14.2	25.7	2.3***	0.981
- women	16.0	24.8	1.9***	14.7	24.7	2.1***	0.590

[1] Lower educational group: no matriculation examination, vocational training either vocational course or on-the-job training; higher educational group: more extensive vocational training regardless of basic education, or at least matriculation examination

[2] OR = odds ratio describes the relative prevalence of the limitation in the lower as compared to the higher educational group (= 1.0); statistical significance of the difference: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[3] p-value indicating the statistical significance of the interaction between points of measurement and educational group; if $p < 0.05$, the change in educational difference from 1978–1980 to 2000–2001 is statistically significant

Table 2. Prevalence of self-rated functional limitations by educational group[1] (%, age-adjusted), their relative prevalence in the lower educational group as compared to the higher educational group (age-adjusted OR[2], higher educational group = 1.0) in 1978–1980 and 2000–2001, and the statistical significance[3] of the change in educational difference between the two points of measurement, population aged 65 or over by gender.

	Prevalence of limitation 1978–80			Prevalence of limitation 2000–01			Change in difference 1978–2000 (p) [3]
	Higher educational group (%	Lower educational group (%)	OR [2]	Higher educational group (%	Lower educational group (%)	OR [2]	
MOBILITY							
Moving about at home							
- men	10.7	17.5	1.9	7.8	10.2	1.4	0.501
- women	13.8	22.5	2.0*	11.3	16.4	1.6*	0.564
Walking 500 m							
- men	22.6	36.6	2.1**	15.3	31.7	2.8***	0.394
- women	33.2	41.1	1.5	30.2	39.2	1.6**	0.789
Climbing stairs							
- men	14.0	21.8	1.8	10.2	24.6	3.3***	0.221
- women	34.2	34.7	1.0	35.1	36.7	1.1	0.861
Carrying a shopping bag							
- men	24.6	40.6	2.3***	18.4	28.6	1.9**	0.564
- women	56.2	59.0	1.1	44.7	51.6	1.4*	0.439
SENSORY FUNCTIONS							
Reading a newspaper							
- men	17.9	31.8	2.3**	9.8	13.4	1.5	0.270
- women	28.9	34.5	1.3	14.6	21.3	1.7**	0.459
Hearing a discussion							
- men	36.4	50.3	1.8**	33.6	44.9	1.6*	0.721
- women	33.2	38.7	1.3	29.4	35.9	1.4*	0.817
ACTIVITIES OF DAILY LIVING							
Dressing and undressing							
- men	7.7	20.4	3.3**	12.8	16.2	1.3	0.057
- women	16.7	24.2	1.7	13.2	17.1	1.4	0.580
Cutting toenails							
- men	24.2	35.8	1.9*	25.6	32.3	1.5	0.447
- women	33.0	44.1	1.7*	29.5	38.1	1.6**	0.771
SOCIAL FUNCTIONING							
Taking care of matters together with other people							
- men	19.0	31.3	2.0*	9.0	11.7	1.4	0.344
- women	24.3	35.2	1.8	10.2	15.8	1.7**	0.902

[1] Lower educational group: no matriculation examination, vocational training either vocational course or on-the-job training; higher educational group: more extensive vocational training regardless of basic education, or at least matriculation examination

[2] OR = odds ratio describes the relative prevalence of the limitation in the lower as compared to the higher educational group (= 1.0); statistical significance of the difference: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[3] p-value indicating the statistical significance of the interaction between points of measurement and educational group; if $p < 0.05$, the change in educational difference from 1978–1980 to 2000–2001 is statistically significant

Table 3. Age-adjusted prevalence (%) of vision and hearing limitations and cognitive capacity by level of education in the population aged 30 or over in 2000–2001.

Variable[2]	Men					Women				
	Primary	Secondary	Tertiary	Total	Difference (p)[4]	Primary	Secondary	Tertiary	Total	Difference (p)[4]
Distant vision impaired	6.7	6.0	4.9	6.2	0.382	8.9	9.0	7.1	8.7	0.357[5]
Hearing impaired	11.8	8.7	6.4	10.2	< 0.001	13.3	12.1	12.3	13.0	0.514
Linguistic fluency[3]	21.0	23.5	27.1	23.4	< 0.001[5]	21.6	23.2	26.4	23.5	< 0.001[5]
Memory[3]	7.4	7.8	8.4	7.8	< 0.001[5]	7.9	8.3	8.6	8.3	< 0.001[5]

Source: Aromaa and Koskinen 2004b, Appendix Table 2

[1] Figures are age-adjusted separately for men and women

[2] Distant vision impaired: visus ≤ 0.5 in distant vision test
Hearing impaired: average hearing threshold in better ear > 25 dB
Linguistic fluency: number of animals named in one minute
Memory: number of words (max 10 words) correctly recalled on third occasion

[3] Average (age-adjusted)

[4] Statistical significance of difference between educational groups

[5] In these cases the pattern of educational differences is not similar in all age groups (statistically significant interaction between age and education, $p < 0.05$)

Hearing

In the population of working age, around one in ten report difficulties hearing a discussion; the proportion is slightly higher for men than women. Hearing difficulties are much more common in the population aged 65 or over: more than 40 per cent of men and about one-third of women say it is hard for them to hear a discussion between several people. In contrast to most other limitations in functional capacity, difficulties in hearing a discussion have not significantly decreased in Finland.

Self-reported hearing difficulties – like almost all other functional limitations – are more prevalent in the lower than in the higher educational group, both before and after retirement age (Tables 1 and 2). The educational differences have remained more or less unchanged since the late 1970s. In the working-age population, educational differences are less pronounced in hearing than in vision difficulties.

Although educational variation in the prevalence of self-reported hearing difficulties shows similar patterns among women and men, measurements of hearing acuity in women indicate no marked educational differences in the

prevalence of poor hearing, whereas in men these differences are very clear. According to the data for 2000–2001, the hearing threshold in the better ear at speech frequencies was greater than 25 dB in about 12 per cent of men with a basic level of education, but in no more than just over 6 per cent of those with a higher education (Table 3).

Cognitive functioning

Cognitive functioning refers to the individual's ability to observe, think, recollect, learn and perform linguistic tasks. A comprehensive assessment therefore requires a wide range of different measurements. However, representative data are only available on certain dimensions of cognitive functioning in the population. In the Health 2000 survey, measurements were conducted of the participants' linguistic fluency and memory. In the linguistic fluency test, the participants were to name as many animals as possible in one minute. In the memory test, they were to memorise a list of ten words by reading the words aloud three times and after each time repeating the words they remembered.

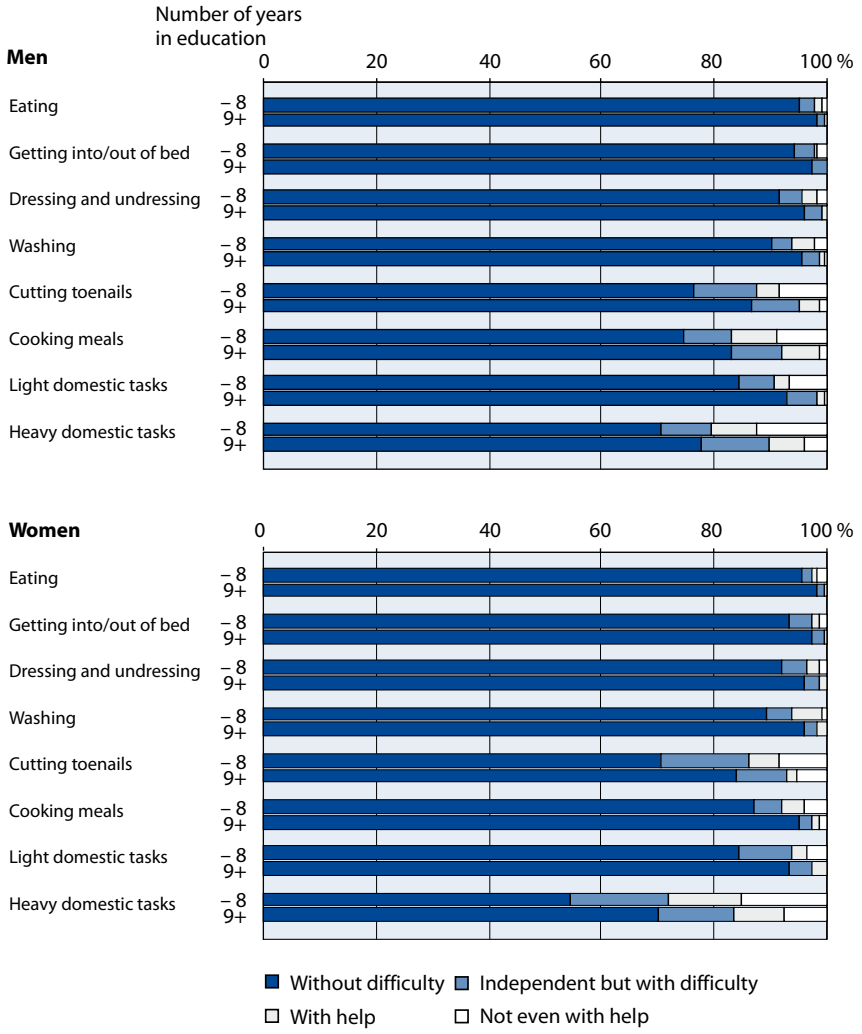
In both these tests, people with a higher education achieved the best results, and the educational differences were highly significant in the population aged 30 or over (Table 3). In the population aged 18–29, too, significant educational differences were observed in cognitive capacity, which in this case was assessed using tests that estimated linguistic fluency and memory for digits (Koskinen et al. 2005). No data are available on changes over time in educational differences.

Managing activities of daily living

One of the key indicators of functional capacity is the individual's ability to cope with various activities of daily living. A distinction is often made between basic (BADL) and instrumental activities of daily living (IADL). Basic activities include, for example, the ability to dress, wash, get up from bed and eat. Instrumental activities, then, refer to those activities that allow people to cope independently in everyday life. Examples include cooking, shopping, and performing domestic chores.

Coping with activities of daily living has improved in the elderly population during the past couple of decades (Aromaa and Koskinen 2004a, Sulander et al. 2003). The improvement has been fastest in the age group 65–74. The prevalence of BADL limitations has decreased in older age groups as well (Sulander et al. 2006b).

Figure 3. Difficulties with certain activities of daily living by gender and education in the population aged 65–84 in 2005 (age-adjusted, %)[1].



[1] Source: EVTK

ADL limitations are much more common in the lower than the higher educational group (Tables 1 and 2). Analyses based on EVTK materials (Sulander et al. 2006a) have shown marked differences in the ability to wash, dress, get into/out of bed, cut toenails, eat, cook meals, and perform domestic chores, for example (Figure 3). This is supported by findings from other surveys. Data from the Health 2000 survey also showed considerable differences among other

tasks in dressing, cutting toenails and carrying a shopping bag (Tables 1 and 2). People with a higher education had less difficulty coping with these activities.

In the elderly population, functional capacity has improved in both the lower and higher educational group (Sulander et al. 2006b). However, the educational differences have been and remain very pronounced. The difference is most apparent in an examination of BADL coping over the last ten years. A comparison of the results for ADL coping in the Mini-Finland and Health 2000 surveys shows that the educational differences remained more or less unchanged, although the prevalence of many limitations decreased markedly from the late 1970s through to the early 2000s (Tables 1 and 2). However, it seems that the educational differences in difficulties with dressing among older men have decreased (Table 2).

Social functioning

In addition to the dimensions discussed above, the concept of functional capacity comprises a wide range of other activities, such as social interaction and participation in education and economic, community and social life. These types of activities that usually involve interaction with other people are often described by using the concept of social functioning, although this is a somewhat ambiguous concept (e.g. Burns and Patrick 2007). In the ICF classification, these activities come under the heading of participation in social situations. The focus here is on two measures describing this dimension: the individual's assessment of how well they get along with other people, and their perceived ability to take care of matters together with other people.

In the AVTK survey in 1995–1998, getting along with other people was assessed with the item: 'During the past month, how often have you got along well with other people?' On average 93–95 per cent of the respondents said they got along well with others all the time or most of the time, and the figures showed no consistent variation by education. In the Mini-Finland survey in the late 1970s, almost one-fifth of men and women aged 30–64 in the lower educational group reported difficulties with taking care of matters together with other people, whereas in the higher educational group such difficulties were experienced by less than 10 per cent (Table 1). Twenty years on, the proportions reporting limitations were much lower in both educational groups, but the educational difference had remained unchanged: in the higher educational group limitations were experienced by less than two per cent, in the lower educational group the proportion was more than twice as high. Both in the late 1970s and early 2000s, self-reported difficulties in taking care of matters to-

gether with other people were more common in the elderly population than in younger age groups (Table 2). In the population aged 65 or over, too, the difference between educational groups showed a similar pattern as among younger people, although in relative terms it was somewhat smaller. Over the 20 years from the late 1970s to the early 2000s, difficulties had decreased in both educational groups and in both men and women, but the educational difference remained unchanged.

Work ability

Work has many different meanings to people: for most it is an important source of livelihood and a major determinant of social status, but it also anchors people to their social environment and at best offers a sense of meaning and satisfaction and provides a vehicle for self-realisation. For society, it is a challenge of great importance to maintain and improve the work ability of the population, both in order to ensure the availability of labour and to finance the social security system. Indeed coping longer in working life has emerged as one of the most pressing social issues of the day. For instance, one of the targets of the Health 2015 programme is to improve the functional capacity and work ability of the working-age population and to develop working conditions so that people could remain at work for about three years longer than was the case in 2000 (Ministry of Social Affairs and Health 2001).

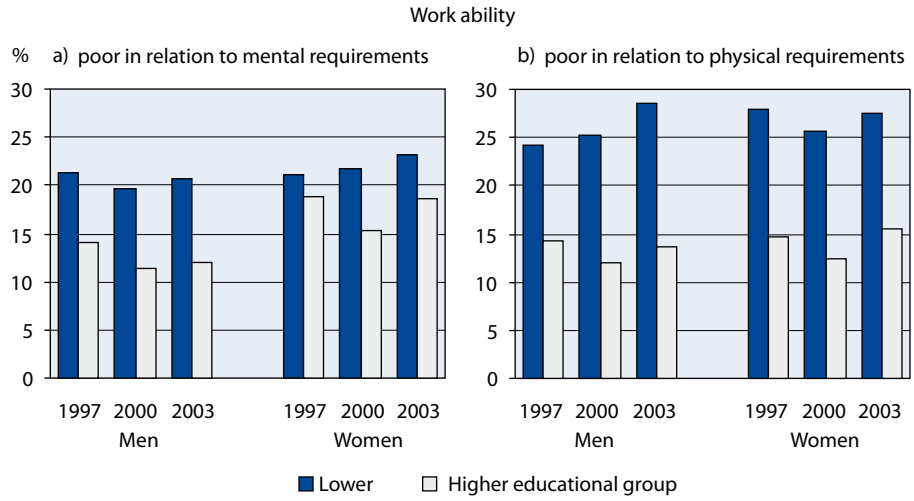
Work ability can be defined in many different ways. From a social insurance viewpoint, the key issue is whether or not the individual meets certain pension criteria: the main emphasis is on the relationship between the individual's functional capacity and the demands of the job as well as on the identification of a disease, defect or injury behind the lowered level of functional capacity. This is a disease-dependent viewpoint in which the accent is on the individual's characteristics. In the multi-dimensional concept of work ability, by contrast, the focus is more broadly on working as a whole: on the individual's resources (health and functional capacity, skills, values and attitudes) and on factors related to work and working, i.e. working conditions, job requirements, the workplace community and management. In addition, consideration is given to the environment outside the workplace: occupational health care, family and other close communities, and ultimately society as a whole, which constitutes the macro environment for work ability (Ilmarinen et al. 2008).

Clear socio-economic differences have been registered in the incidence of disability pensions. During 1976–1985, the risk of disability pension in the economically active population aged 40–59 was highest for blue-collar and lowest

for upper white-collar workers (Hytti 1993). In the 1980s and 1990s, too, the risk of early retirement was greater among older workers with less education than among those with more education (Hakola 2000, Rantala and Romppanen 2004).

Perceived work ability also varies clearly by education. According to Work and Health surveys in 1997, 2000 and 2003, poor or moderate work ability, both in relation to physical and mental job requirements, was reported far more often by people with less education than by those with more education (Figure 4). In the Health 2000 survey, too, perceived work ability was clearly better the higher the level of education; the differences were less pronounced among employed people than in the whole population, but still in the same direction (Martelin et al. 2008). Confidence in one's ability to continue in the same job in two years' time also varied clearly by level of education: whereas in the age group 55–64 the proportions of women and men with a higher education who believed they would still manage in their current job in two years' time were 84 and 88 per cent, respectively, the corresponding figure for women with a basic education was only 57 per cent and for men 68 per cent (Gould 2002). Educational differences in work ability are probably related in part to socio-economic health inequalities and their underlying factors. However, education can also impact work ability via other routes: it produces occupational competencies which support job control, coping at work, and job motivation.

Figure 4. Age-adjusted prevalence (%) of poor or moderate work ability in relation to mental (Figure a) and physical (Figure b) job requirements by education and gender in the population aged 25–64 in 1997, 2000 and 2003.[1]



[1]Source: Work and Health survey

The proportion of people on disability pension has declined during the period from 1980 to 2000, and perceived work ability has improved as well: based on the Mini-Finland and Health 2000 surveys, the proportion of people who regarded themselves as completely or partly disabled decreased from less than one-quarter to just under 20 per cent (Koskinen et al. 2008). Within educational groups, however, the change was relatively minor, and the high differences in perceived work ability remained unchanged (Table 1). In fact, the improvement in perceived work ability seen in the total population can largely be attributed to the rise in overall educational level: the proportion of people with a higher level of education who rate their own work ability as good, is clearly higher than 20 years ago. However, it is not clear to what extent this has to do with the impacts of rising levels of education and to what extent it follows from changes in the occupational structure and job tasks, which reflect the rise in the level of education.

In conclusion

There are clear and marked educational differences on different dimensions of functional capacity: regardless of age, people with less education more frequently report limitations in mobility, sensory functions, cognitive functions and various activities of daily living, for instance, than people with more education, and their work ability is poorer as well. In addition to the measures of functional capacity discussed here, socio-economic differences have also been observed on several other dimensions. For example, in a follow-up study of a cohort of older people in Jyväskylä, education, income or both were associated with virtually all measures of functional capacity, such as walking speed, vital capacity and hand grip strength (Rautio et al. 2005). Similar observations have been reported in other countries, too (e.g. Deeg et al. 1992, Stuck et al. 1999, Guralnik et al. 1993, Grundy and Glaser 2000, Broese van Groenou et al. 2003, Huisman et al. 2003, Beydoun and Popkin 2005). Underlying these socio-economic differences in functional capacity are differences in the prevalence of various diseases that adversely affect functional capacity as well as associated risk factors deriving from living conditions and health behaviour. Socio-economic differences in functional capacity may also be caused by differences in living environment: obstacles to mobility in the dwelling and the living environment, for instance, correlate with difficulties in functional capacity (Vaarama 2004).

Most indicators suggest that over the past 20 years, the Finnish population's functional capacity has improved. However, there have been no marked

changes in educational differences. As the population continues to age, it is increasingly important that efforts are stepped up to improve people's functional capacity. If the current positive trends can be sustained, that would significantly reduce the number of people needing daily help in the future compared with the prediction assuming that the age-specific prevalence of limitations would remain on the level of the beginning of the 2000s (Koskinen et al. 2006). If all population groups could attain the same level of functional capacity now enjoyed by those who are in the strongest position, the functional capacity of the population as a whole would improve considerably. Whether this goal is achievable depends on how successful the efforts are to reduce the differences in the underlying factors responsible for functional limitations: on the one hand in diseases and their risk factors, such as working and living conditions, and in the prevalence of obesity, smoking and other health-threatening lifestyles, and on the other hand in the requirements imposed on functional capacity by both the social and physical environment.

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3.6 Healthy life expectancy

Ari-Pekka Sihvonen, Seppo Koskinen and Tuija Martelin

Comparative analyses of the population's general health in different countries, different demographic groups and across different points of time are often based on mortality indicators. This is largely because reliable and comparable long-term mortality data are readily available in many countries, but it is also thought that mortality describes the population's health more generally as well: if in a certain population mortality is high, then it is reasonable to assume that people also have more illnesses and disabilities than normal. Mortality figures do not, however, tell us anything about the role and significance of musculoskeletal diseases, mental disorders and other health problems that rarely lead to death – yet all of these have a major impact on people's functional capacity and well-being.

Studies of morbidity, then, may be hampered by problems with the availability, reliability or comparability of data on the prevalence of many diseases and functional limitations. Furthermore, morbidity data obviously only describe those people who are alive at a certain age. The older the age group concerned, the smaller and more select that group will be, because most survivors will have been the healthiest members of their birth cohort to start with. Based on 2004 mortality levels, for example, some 60 per cent of men in Finland would reach the age of 75. In an analysis of the health of older age groups, therefore, it is particularly important to bear in mind how large a proportion of the original birth cohort is included in the health comparisons.

To help overcome these difficulties, a whole range of measures have been developed that take account not only of mortality, but also morbidity or functional limitations. In the 1980s, a mortality and survival table method gained favour that links mortality data for different age groups with data on morbidity or functional capacity to form an indicator describing the number of healthy or disability-free life years (Robine, Jagger and Romieu 2001).

What is healthy life expectancy?

The expectancy of healthy or disability-free life years describes how long a person of a certain age could on average expect to live healthy or to have good functional capacity, assuming no change in the current mortality and health conditions. The healthy life expectancy is, therefore, not a prognosis, but a measure comparable to life expectancy that describes that particular point in

time. Unhealthy life expectancy or expected years with disability, accordingly, describe how long a person of a certain age could expect to live unhealthy or with a disability. In other words, the life expectancy of a person of a certain age is divided into two parts: healthy or disability-free life expectancy, and unhealthy or disabled life expectancy (Sullivan 1971).

The calculation of healthy life expectancy starts from the mortality and survival table, or life table that is based on age group specific mortality data for the population and time period concerned. The life table describes mortality and survival in a hypothetical cohort of newborns, i.e. an imaginary group of people born in a certain year. The table shows the rate at which the number of people alive in that cohort decreases as the cohort gets older, as it is exposed to the age specific risk-of-death factors observed at a certain point of time. It includes data on the average number of remaining life years or life expectancy of newborns and people of different ages and on the percentage share of people who have reached a certain age. The principle in calculating the healthy life expectancy is that for each age range of the hypothetical cohort in the mortality and survival table, total life years are divided between 'healthy' and 'unhealthy' years. The expectancy of healthy life years is obtained by dividing the total number of healthy life years lived by the hypothetical cohort after a certain age by the number of survivors at this exact age.

Our focus in this section is on the population aged 25 or over, which is divided into three educational groups according to the highest degree completed: basic education (corresponding to 9 years or less education), secondary education (10–12 years), and higher education (13 years or more education).

For the calculation of the healthy life expectancy, we need to have age group specific mortality and morbidity data. The educational mortality data used here are based on a Statistics Finland source on living conditions and causes of death, which links 1990 census data with data on deaths in 1991–1993 (Martikainen and Valkonen 1995, see also Valkonen et al. in this report). The data on health by educational group are based on material collected by Statistics Finland for the 1994 Living Conditions Survey in the non-institutionalised adult population (Huuhka et al. 1996).

Healthy life expectancy can be calculated by using several different indicators of health and functional capacity. The number of healthy or disability-free life years depends of course largely on how morbidity and functional capacity are measured and defined. If only years of severe illness are deducted from life expectancy, then the number of healthy life years will obviously be higher than if minor functional limitations are also taken into account (Sihvonen et al. 1994).

Below, health status is described by the measure of self-rated health (see also Rahkonen et al. in this report, Manderbacka 1998). Experience has shown that responses to questionnaire items on self-rated or perceived health accurately reflect both perceived medical health and physical fitness, and they also predict mortality and disability (Manderbacka 1998).

The measure of self-rated health is based on the respondents' assessment of their own health on a five-point scale: very good, good, average, poor, and very poor. This scale is used in our calculations here in two ways. First, when perceived health is rated as poor or very poor, this is interpreted to indicate the presence of illnesses and possibly functional limitations. In the second approach, poor health is taken to comprise average or poorer assessments of health. This is interpreted to include also milder morbidity and disability.

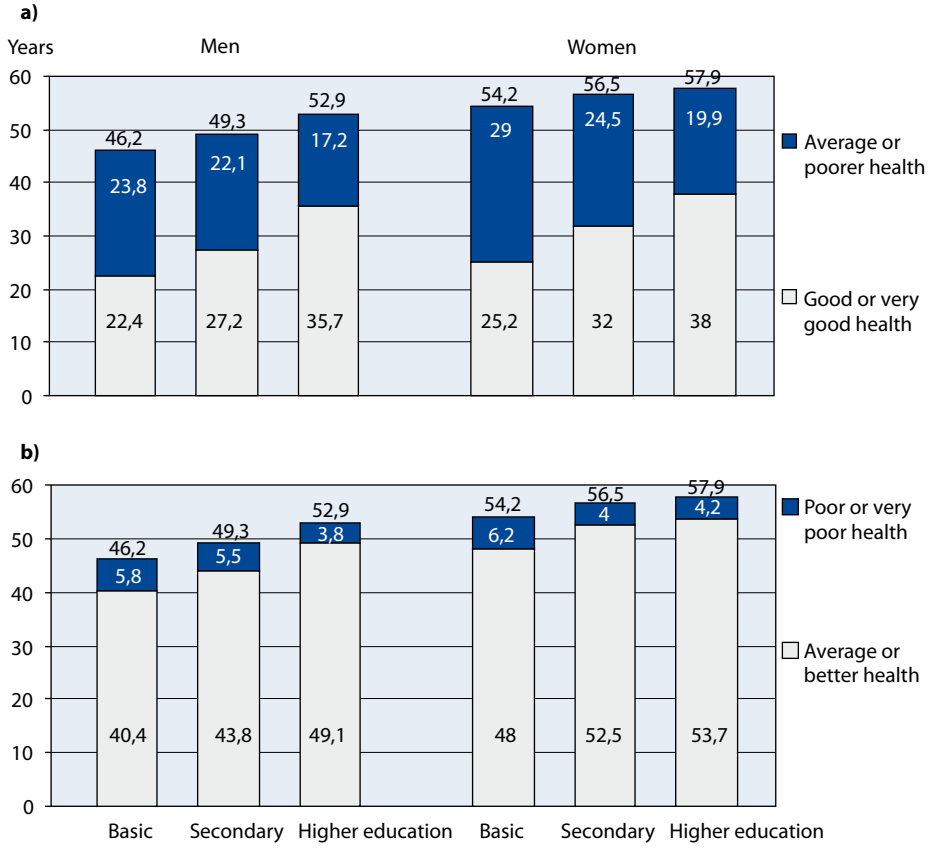
Educational differences in healthy life years

According to both indicators of poor health, women are expected to have at least somewhat more unhealthy life years than men. This means that there is less gender variation in the number of healthy life years than in the total number of life years.

There are clear educational differences in life expectancy among both men and women: the higher the level of education, the longer the life expectancy (Figure 1, cf. also Valkonen et al. in this report). In the early 1990s, the life expectancy of men with a higher level of education at age 25 was 6.7 years longer than that of men with no more than basic education. The life expectancy of men with a secondary education is in between these groups. Among women, the educational differences in life expectancy are less pronounced, but considerable nonetheless: 3.7 years between women with a higher and a basic level of education. Even so, there is a clear difference between women in the weakest position and men in the best position: women with a basic level of education can expect to live 1.3 years longer than men with a higher education.

According to both measures of self-rated health, people with a basic level of education have more disabled life years ahead of them than people with a higher education. Indeed, educational differences in healthy life years are even greater than educational differences in life expectancy. When the number of unhealthy life years is calculated on the basis of the number of years that a person's self-rated health is poor or very poor, the educational difference in healthy life expectancy is about two years greater than the corresponding difference in life expectancy, in both men and women (Figure 1, lower part). When illness is measured on the criterion of average or poorer self-rated health, the difference

Figure 1. Life expectancy and healthy life expectancy of men and women aged 25 by educational group according to a) average or poorer self-rated health and b) poor or very poor self-rated health in the early 1990s.



in healthy life expectancy between men and women with a higher and a basic level of education is as much as 13 years. People with a secondary education come in between these groups.

People with a higher level of education have not only more disability-free life years and less disabled life years than other educational groups, but the number of disability-free life years as a proportion of their total life years is also higher than for others.

As for healthy life years, the pattern of gender differences is not quite as consistent as in the case of differences in life expectancy: on average, men with a higher education have as many or more healthy life years than women with a basic level of education. When illness is measured on the criterion of average or poorer self-rated health, men with a higher level of education have almost as

many healthy life years ahead of them as women with a higher level of education.

In the analysis above, socio-economic position is measured by education, but there are no grounds to assume that the results would have been essentially different had we used some other indicator of socio-economic position. It is unlikely that the main results for educational differences would be very different even if we used other indicators of health than self-rated health (Valkonen et al. 1997, Sihvonen et al. 1998). People with a high social status live longer than people with a low social status, and they furthermore have more healthy life years and less unhealthy or disabled life years.

Comparisons and conclusions

There have been few international comparisons of socio-economic differences in the number of healthy life years.

In the mid-1980s, educational differences in the number of disability-free life years in Finland and Norway were of the same magnitude (Sihvonen et al. 1998). Educational mortality differences were greater in Finland than in Norway, whereas morbidity differences were greater in Norway than in Finland. Mortality differences are probably more relevant to the overall assessment of health inequalities than morbidity differences, since the time that people live with an illness can often be very valuable both for the individual him or herself and for their family and significant others. On this basis it can be concluded that health inequalities have been more pronounced in Finland than in Norway, even though there have been no marked educational differences in healthy life years.

The lengthening of life expectancy has also increased the number of healthy life years: even though there might have been a slight increase in the number of years lived with mild health problems, there has been no marked increase in the amount of time burdened with more severe health problems (Sihvonen 2005, Sihvonen 1998, Sihvonen et al. 2003, Cambois and Robin 1996).

In the early 1990s, educational differences in disability-free life years were at roughly the same level as in the mid-1980s, both among men and women (Sihvonen 2005). Measured in terms of poor or fairly poor self-rated health, the difference in disability-free life years between people with a higher and a basic level of education decreased to some extent, but on the criterion of at least average self-rated health, the difference was around 13 years even in the mid-1980s.

The calculation of disability-free life expectancy in different socio-economic groups at different points of time places considerable requirements on

the datasets used in that the indicators of socio-economic status have to be defined and formed in exactly the same way in the mortality and morbidity data collected at different time points. The data reported above on educational differences in the length of disability-free years in the early 1990s are the most recent available. According to the results presented in this report, educational mortality differences have increased appreciably (Valkonen et al.), and differences in self-rated health have remained unchanged or narrowed to some extent (Rahkonen et al.). On this basis the inference can be drawn that at the turn of the millennium, educational differences in healthy life years were at least as marked as in the early 1990s.

Research on healthy life years integrates data on mortality and health. This helps to illustrate the number of healthy and active years lost to illness and declining functional capacity. One of the goals of the Health 2015 programme is to increase the healthy life expectancy of Finnish people by two years: for this reason it is important to monitor the population's health in the light of this indicator as well. Although the goal of reducing health inequalities is concretely about reducing differences in mortality, the attainment of the general objective of equality as set out in the Health 2015 programme also requires keeping a close eye on the development of socio-economic differences in healthy and disability-free life expectancy.

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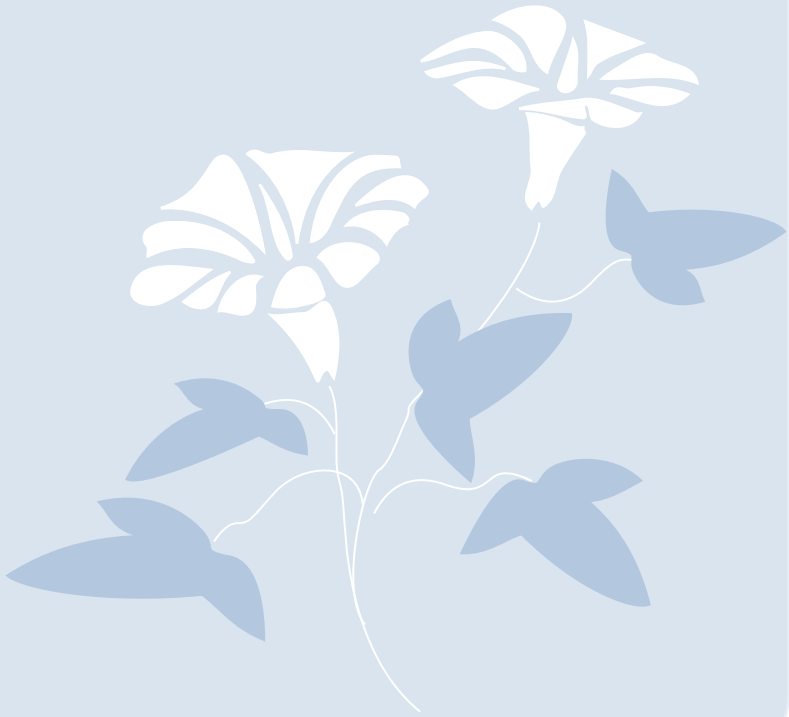
4 SOCIO-ECONOMIC HEALTH INEQUALITIES: DETERMINING FACTORS AND HOW THEY HAVE CHANGED



4.1 Health behaviour

4.1.1 Introduction

Ritva Prättälä

Researchers are not always fully agreed on the role of lifestyles or health behaviours in socio-economic inequalities in health. Some schools of explanation think of health behaviours and psychosocial factors (such as social support, sense of coherence and stress) as mediating determinants in-between socio-economic position and health status. Explanations anchored to health behaviour, then, are sometimes seen as antithetical to psychosocial explanations, while other lines of explanation disregard the role of health behaviour more or less completely. In recent years, however, with the continuing accumulation of evidence on the contribution of health behaviours to the causation of health disparities, researchers in this field have begun to pay increasing attention to health behaviour (see also Chapter 2 by Lahelma et al. in this report).

Health behaviour and its various manifestations do not grow out of a vacuum, but they are deeply rooted in the social and cultural environment, just as inequalities in health and their causative factors more generally. Adverse health behaviours are seen as a link in the chain that leads from low socio-economic position to poor health. A high socio-economic position, for its part, involves social, economic and knowledge resources that support behaviour conducive to good health. In other words, the thinking is that socio-economic status impacts health largely through health behaviour. (Mackenbach et al. 2002.)

This Chapter deals with socio-economic differences in health behaviour and describes how they have changed since the 1980s. The purpose is to offer an assessment of how far ordinary, everyday health behaviours or lifestyles vary by socio-economic position, and how far high socio-economic position groups have healthier behaviours than others. A further concern is to find out whether these differences contribute to socio-economic mortality and morbidity differences, and whether we can expect to see any changes in the future in the level of inequalities attributable to health behaviours.

Our decision to focus on smoking, alcohol use, dietary habits and physical activity was motivated by the knowledge that these four habits are major risk or protective factors to important public health problems in Finland. The examination is mostly confined to people of working age because it is in this age group that socio-economic health inequalities are the most pronounced and

a large body of research data is available. These data are complemented with results for both young people and older people aged 65 or over.

Indicators of socio-economic position, such as education, income and occupational position, can be associated with health behaviour via different mechanisms. Education increases opportunities to acquire and assimilate knowledge about healthy living habits, and the education environment itself can offer concrete examples for health-promoting habits, for instance through physical exercise (PE) classes and school meals. People with higher incomes are better placed to purchase exercise equipment and services and in this way to engage in diverse forms of exercise regardless of costs, weather and place of residence. People in higher occupational positions often have access to employer-provided meals and sports facilities and to occupational health services, which can be an invaluable asset in combating alcohol and nicotine dependence, for instance. There are also different health cultures in different occupational fields, and some workplaces are more supportive of healthy living habits than others.

Education, income and occupational status indicate socio-economic status in different ways at different stages of life. Occupational status is a useful indicator for people of working age, but it says less about the position of young people or pensioners. Incomes matter for people who are at work and for those who are retired, but in younger age groups parental income is often a more important factor. We have chosen to use education as our primary indicator of socio-economic position, firstly because evidence on educational differences in health-related behaviour is most readily available, and secondly because education is best suited for comparisons of groups of different ages. However, educational levels have continued to rise in Finland over the past couple of decades, and the matriculation examination probably had greater weight as an indicator of socio-economic position 20 years ago than it does today. For this reason education is here described by reference to relative education, whenever that indicator could be formed. This was done by dividing all working-age respondents in the survey into three equally large education categories based on their year of birth. Each respondent was thus slotted into the highest, middle or lowest tertile based on the number of years they had spent in education. Where the measure of relative education was not available, an indicator of absolute education was used instead that allowed for a corresponding classification into three groups, viz. those with a short, intermediate or long education. Typically, a short education here referred to primary or comprehensive school; intermediate education to secondary level education; and long to post-secondary education. As for other indicators of socio-economic position, the most frequently

used measure was that of occupational status: upper-level white-collar workers, lower-level white-collar workers, and blue-collar workers.

The following subsections on health behaviour make use of existing datasets and research reports. The most important sources are the twin health behaviour surveys Health Behaviour and Health among the Finnish Adult Population (AVTK) and Health Behaviour and Health among the Finnish Elderly (EVTK) and the national School Health Promotion Study. Conducted regularly by the National Public Health Institute since 1978, AVTK is a postal questionnaire among some 5,000 Finnish persons aged 15–64. Response rates have varied from around 67 to 80 per cent and have shown a tendency to decline over time. The questionnaire includes items on daily smoking, quitting and starting smoking, the use of different alcoholic beverages during the previous week, the use of different foods important to health (e.g. bread spreads, type of milk, vegetables) and the frequency of leisure time physical activity. The EVTK questionnaire has been mailed every other year since 1985 to a sample of Finnish people aged 65–79 (since 1989 aged 65–84). Response rates have been over 70 per cent. The structure and health behaviour items in the EVTK questionnaire are largely the same as those covered in the questionnaire for the adult population.

The School Health Promotion Study by the National Research and Development Centre for Welfare and Health (STAKES) is conducted among comprehensive and upper secondary schools students aged 14–18 from different parts of the country. Administered in a class situation, the questionnaire is designed to collect data on key aspects of health behaviour, smoking, alcohol use, dietary habits and physical activity. The picture is complemented by results from other surveys, such as the Drinking Habits Survey, the study on nutritional quality of diet in Finland and the Adolescent Health and Lifestyle Survey.

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4.1.2 Smoking

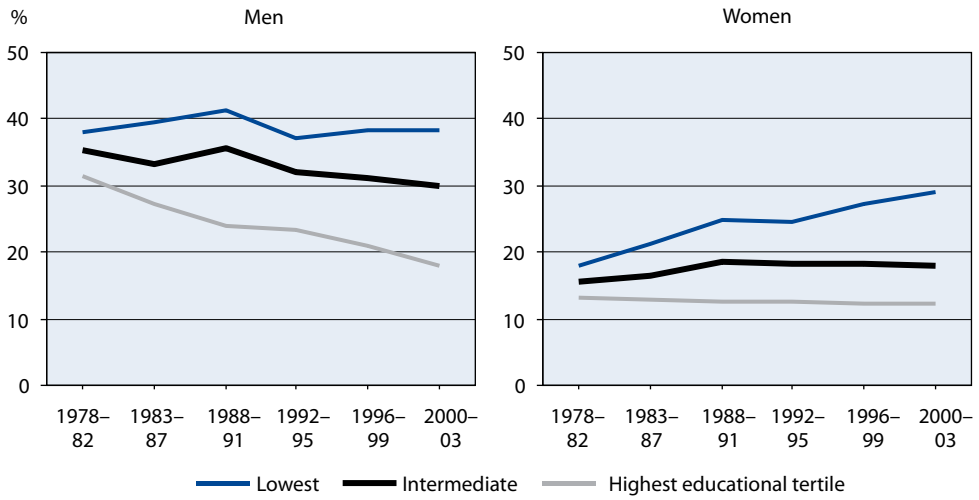
Mikko Laaksonen, Satu Helakorpi, Sakari Karvonen, Kristiina Patja and Tommi Sulander

Smoking in the Finnish population of working age has been regularly monitored since 1978 (Helakorpi et al. 2003). Smoking among men has slowly and steadily decreased, among women the number of smokers first increased somewhat, but since the mid-1980s the figures have remained unchanged. Today, 27 per cent of men and 20 per cent of women are daily smokers. In addition, some six per cent of men and women say they smoke occasionally.

Educational differences in the working-age population

Figure 1 shows the prevalence of smoking in Finnish adults aged 25–64 by educational group in 1978–2003 (Helakorpi et al. 2003). In this analysis the educational groups are formed by year of birth so that people born in a certain year are divided into tertiles based on the number of years spent in education.

Figure 1. Age-adjusted percentage[1] of daily smokers in the age group 25–64 by relative education (educational tertiles) in 1978–2003.



Source : Helakorpi et al. 2003

[1] Age standardisation is calculated by the direct method for 10-year age groups using the male plus female population as the standard population.

Daily smoking is more common in lower than higher educational groups. During the period under review the differences in smoking prevalence between the three educational groups have steadily increased among both men and women. Among men, the prevalence of smoking has remained unchanged in the lowest educational group, but decreased in the intermediate and especially in the highest group. Among women, smoking has remained unchanged in the highest and intermediate educational groups, but increased in the lowest educational group. During the period under study the prevalence of smoking increased among women in the lowest educational category from 18 to 29 per cent. Evidence from other data sources confirms that educational differences in smoking have been growing (Salomaa et al. 2003).

Other socio-economic differences in the working-age population

The average age at smoking onset in Finland is 14 years, an age when the young person's living environment and time use is very much influenced and determined by school. After completion of school and the move into the employment, other socio-economic factors such as occupational status and income may assume greater significance. Educational level typically remains more or less unchanged during adulthood (at least it doesn't decline), and therefore it does not provide an accurate reflection of the changes happening in the individual's social and economic situation later in life. Another reason why other socio-economic indicators than education may be relevant in the case of smoking is that they may influence smoking through different kinds of mechanisms. For example, education may describe the knowledge and skills that are needed to quit smoking, whereas occupational position may better describe the current living environment and the impact of work-related factors, while income reflects material living conditions and opportunities.

Trends in the prevalence of smoking have not been published by any other socio-economic indicator than education. Figures for occupational categories in separate years can be extracted from the AVTK (Health Behaviour and Health among the Finnish Adult Population) reports. Daily smoking is clearly more common among blue-collar workers than lower or upper white-collar workers. The prevalence of smoking among employers and own-account workers is at roughly the same level as among lower white-collar workers (Helakorpi et al. 2003).

In a study among employees of the City of Helsinki, smoking was measured against several different socio-economic indicators (Laaksonen et al. 2005). Smoking was found to be associated both with low education, occupational

status and household disposable income. Among women income showed a weaker correlation with smoking than either education or occupational status, among men all these indicators showed roughly the same correlations with smoking. Furthermore, financial dissatisfaction and living in rented accommodation were associated with smoking even after controlling for these traditional socio-economic indicators.

Impact of onset and cessation on socio-economic differences in smoking

Socio-economic differences in smoking may be influenced by differences in both the onset and cessation of smoking. Educational differences in the onset of smoking were studied using the FINRISK dataset by looking at the proportion of people who had ever smoked during their lifetime (Laaksonen et al. 1999). The subjects were divided into two equally large educational groups on the basis of birth cohort median. Among men, the onset of smoking decreased from 1972 to 1997 in both educational groups, but was consistently somewhat less frequent in the higher educational group. Among women, the onset of smoking increased in both educational groups, but among women born in the 1950s and later the proportion who started smoking was consistently higher in the lower educational group. This is in line with earlier results which show that smoking among women with less education increased much more sharply from the 1960s onwards than among those with more education (Martelin 1984).

Educational differences were also seen in the cessation of smoking, although the change in differences over time was marginal (Laaksonen et al. 1999). The number of those who quit smoking as a proportion of ever smokers increased among men in both educational groups, but quitting was consistently slightly more common in the higher educational group. Among women the numbers who quit smoking increased somewhat more in the higher than the lower educational group.

Socio-economic differences in the cessation of smoking have been assessed in a longitudinal study with a twin dataset (Broms et al. 2004). During the nine-year follow-up, 22 per cent of men and 19 per cent of women quit smoking. Quitting was more common in the higher than lower educational group, but the findings for different occupational groups were inconsistent.

Young people

According to the Adolescent Health and Lifestyle Survey, there have been only marginal changes in adolescents' experimenting with smoking over the past 25 years. However the daily use of cigarettes and other tobacco products has decreased in recent years among adolescents aged 14 and 16. In 2003, 23 per cent of boys and 26 per cent of girls aged 14–18 used cigarettes or other tobacco products (primarily snuff) (Rimpelä et al. 2003).

No recent data are available on long-term trends in smoking and socioeconomic smoking differences in young people. The international ESPAD survey has monitored smoking among young people by parental education in the late 1990s and in 2003. The results show a minor but persistent difference by parental education, with a larger proportion of smokers among children of parents with no more than comprehensive schooling than among children whose parents have an academic education (Ahlström et al. 2004). The North Karelia Youth Project found no association between parental education and smoking among young people (Paavola et al. 2004).

The educational level of young people themselves, on the other hand, shows a strong association with smoking (Table 1). While about one in five students in the second grade of upper secondary school are daily smokers, the corresponding proportion among vocational school students is almost one in two. To some extent the differences between upper secondary schools and vocational schools are due to selection into different educational paths: among the first grade students of the upper secondary school, the prevalence of daily smoking is clearly lower than among those who attend the last grade of comprehensive school while there is no difference in the proportion of never smokers. It thus seems that smokers less often continue to upper secondary school. The clear difference between the second grade students of upper comprehensive school and vocational school in having never smoked also support the selection hypothesis. Selection into post-comprehensive education reflects educational achievement, which also correlates with smoking. According to the 1997 ESPAD survey, one in five students in the ninth, last grade of comprehensive school with better than average educational achievement reported having smoked more than 40 times in their lifetime, while the corresponding proportion among those with lower than average educational achievement was one-half.

Table 1. School Health Promotion Survey results on smoking among boys and girls (%) in 2000.

	Comprehensive school 8th grade		Comprehensive school 9th grade		Upper secondary 1st grade		Upper secondary 2nd grade		Vocational school 2nd year	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Daily	22	21	29	27	17	20	19	21	48	45
Once a week or more often	5	7	5	7	5	7	5	8	5	4
Less often	8	12	9	13	13	15	17	15	8	7
Stopped or quit smoking	18	15	19	17	22	20	22	20	18	21
Never smoked	46	45	37	36	43	38	37	36	21	23
N	11 779	11 654	11 731	11 653	5 446	7 608	4 784	6 540	3 489	2 632

Source: STAKES School Health Promotion Survey 2000.

Population aged 65 or over

Daily smoking among men aged 65–79 decreased somewhat from 1985 to 2001 (Sulander et al. 2004a). During the same period, daily smoking among women in the same age range has remained low. The differences in the prevalence of smoking between men who had worked in industry, office jobs and agriculture were minor throughout the period under review. Among women, smoking was significantly less common among those who had worked in agriculture than among those who had worked in industry and office jobs.

Educational differences in smoking prevalence among the elderly have been studied in EVTK (Health Behaviour and Health among the Finnish Elderly) surveys (Sulander et al. 2004b), which have shown only minor differences over the past ten years. However, a slightly larger proportion of women in the lower educational group than in the higher group report that they have never smoked during their lifetime. One factor that helps to explain the marginal socio-economic differences in smoking among elderly women is that women in these birth cohorts have smoked very little during their lifetime. Among men, the higher mortality of smokers may have contributed to level out the socio-economic differences in this age group.

Discussion

There are marked socio-economic differences in the prevalence of smoking among Finnish men and women of working age. These differences have increased over the past 20 years. Among men, smoking has decreased more sharply in higher than lower socio-economic groups, whereas smoking among women has increased primarily in the lowest socio-economic group (Helakorpi et al. 2003). Smoking explains a substantial part of the socio-economic differences in mortality (Pekkanen et al. 1995, Schrijvers et al. 1999).

Analyses of smoking trends often refer to the smoking epidemic model (Lopez et al. 2004). This model suggests that the smoking habit is first adopted by men in higher socio-economic groups, and lower socio-economic groups follow suit after a delay. By this time, the prevalence of smoking will have started to decline in higher socio-economic groups, as more and more people are quitting the habit. Eventually the same tendency will spread to lower socio-economic groups, causing the socio-economic differences to narrow or disappear altogether. Among women, the smoking epidemic spreads in the same way, only 10–20 years later. In other words during the expansive stage of the smoking epidemic, the socio-economic differences are reversed, and it is only in the latter stages of the epidemic that lower socio-economic groups smoke more than higher socio-economic groups. In Finland, too, the smoking habit initially spread exactly as predicted by this model, but since the 1980s developments have taken a slightly different turn (Rahkonen et al. 1995). It seems that socio-economic differences in smoking are not going to narrow soon. On the contrary, results from the FINRISK survey indicated that among women, educational differences in smoking were greater in younger age groups, suggesting that these differences are set to increase (Salomaa et al. 2003). In older age groups, too, the smoking history of birth cohorts is reflected in future socio-economic differences in smoking. If there are no marked changes in smoking cessation, socio-economic differences in smoking among women aged 65 or over will remain high once the babyboom generation born right after the Second World War reaches retirement age.

Smoking onset is concentrated in the space of just a few years of youth. This period is obviously critical from a prevention point of view. The results of the School Health Promotion Study indicate that socio-economic differences in smoking are partly attributable to selection. For example, smoking frequency among upper secondary school students is lower than average. Indeed complex social and cultural mechanisms are at play in the associations between smoking and educational level. For this reason it may be difficult to prevent the develop-

ment of socio-economic differences in smoking by means of interventions that are focused on smoking alone. Since there are very marked differences between educational institutions in smoking frequency, it is necessary not only to step up anti-smoking education at vocational schools, but more generally to take account of the role of communities that sustain smoking. For instance, combating general deprivation among young people might well prove a powerful tool for anti-smoking policy (Karvonen and Rahkonen 2002).

The associations between income and smoking are largely similar to those seen in the cases of education and occupational position. In other words, income is primarily an indicator of socio-economic position as far as smoking is concerned. A high income does not automatically increase consumption in line with straightforward economic theory, nor does a low income in itself prevent smoking. Nevertheless if the price of cigarettes and tobacco products were to be raised, that would probably have a greater impact on lower socio-economic groups as well as on younger age groups; therefore such a price hike might well prevent young people of limited means from establishing the smoking habit (Townsend et al. 1994). Lowering the cost of nicotine replacement therapy and other treatments can be assumed to have similar effects. It is possible, therefore, that lower socio-economic groups might benefit more than others from steps to make support for quitting smoking more readily available.

Finland has taken various legislative measures to discourage people from smoking. However, only limited work has been done to assess the impact of these measures on socio-economic differences in smoking. The tightening of the Tobacco Act in 1995 had the effect of reducing smoking in the workplace and thus of reducing employee exposure to passive smoking. In the short term, the decrease in smoking was somewhat more pronounced among employees with less education (Heloma 2003). In 2000, the workplace smoking restrictions were extended to apply to restaurants. The main purpose of the law was to protect restaurant employees, but it may well have an effect on customers' passive and active smoking, too (Autio et al. 2001). There have been marked differences in how rigorously restaurants have implemented the law. The new, stricter Tobacco Act may reduce socio-economic differences only if it manages to support lower socio-economic groups in changing their smoking habits.

None of the measures introduced so far to reduce smoking have had the effect of reducing socio-economic differences in smoking. In fact some of the measures may even have acted to increase these differences. Because of their better resources, it is possible that higher socio-economic groups benefit more from the prevention efforts that are aimed universally at all. In order that the socio-economic differences can be effectively reduced, steps are needed that

take account of the special conditions and needs of people with the weakest resources. As yet such targeted measures have been very limited (Karvonen and Rahkonen 2002). Examples might include campaigns to discourage the onset of smoking, taking account of the differences in knowledge and skills requirements and the different target groups; the promotion of non-smoking and smoking addiction treatment programmes in school and student health services; and support for smoking cessation in occupational health services, focusing on jobs and occupations where smoking is most common.

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4.1.3 Alcohol use

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Per capita alcohol consumption has doubled in Finland from the early 1970s to 2005 (STAKES 2006). Consumption of milder beverages has increased at the expense of spirits, but it is still quite rare for people to drink with meals. Binge drinking, on the other hand, continues to be relatively common (Mustonen et al. 2001, Mustonen et al. 2005). The number of abstainers has decreased sharply since the early 1980s, especially among women (Mustonen et al. 2001, Helakorpi et al. 2005).

Duty-free travellers' allowances for alcohol imports from other EU countries, i.e. also from Estonia from May 2004 onwards, were abolished in 2004. At the same time, alcohol taxes were lowered on average by one-third. Estimated total consumption of alcohol consequently increased by about ten per cent from 9.4 litres to 10.3 litres per capita (Österberg 2005), and has since remained at this higher level (STAKES 2006). Finland has not been a low-consumption country for a long time, and with this recent upsurge in consumption we have now exceeded the European average. For example, official reported consumption in France is the same 10.3 litres per capita as the total consumption in Finland (World Drink Trends 2004), although it is estimated that unrecorded consumption adds a further litre to the French figure (Leifman 2001). Since the rise in consumption in Finland was apparently triggered by the drop in prices, there were fears that drinking would increase most sharply among people in the lowest income brackets.

The jump in consumption in 2004 has already led to an increase in various problems associated with excessive drinking and related incidents, such as visits to A-Clinics and detoxification centres, the number of drunken persons taken into custody, assaults, and the number of people injured in drink-driving accidents. In 2004, the number of alcohol-related hospitalisations increased by nearly one-tenth. Among alcohol-related deaths, the sharpest relative increase (30 per cent) was recorded for mortality from liver diseases. Deaths from alcohol poisoning as well as all alcohol-attributable diseases and alcohol poisonings increased on average by one-fifth (Mäkelä and Österberg 2006). In 2005 the number of alcohol-related deaths increased further by about one-tenth from the figures in 2004 (Statistics Finland 2006). In 2004–2005, alcohol-related deaths increased almost exclusively among people out of work. When these people were divided into groups according to their latest occupation, alco-

hol-related deaths increased by far the most in the group of unskilled workers (Herttua et al. 2007).

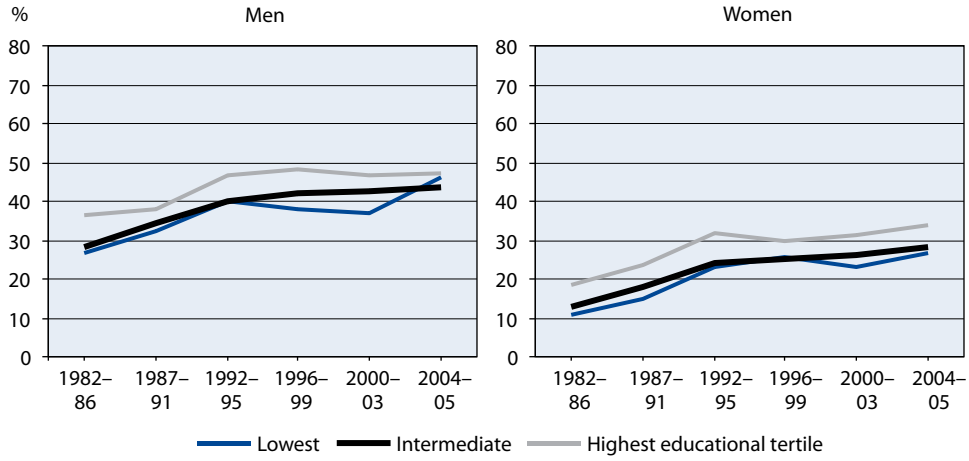
Working-age population

Data on how educational differences in alcohol consumption have changed over time in the working-age population were obtained from the Health Behaviour and Health among the Finnish Adult Population (AVTK) surveys. Figures on the weekly volume of alcohol consumption are based on self-reported consumption of different beverage types in a postal questionnaire survey.

Alcohol consumption has increased in all educational groups from the early 1980s to 2005 (Figure 1). The number of men who report drinking at least eight units of alcohol a week has long been higher in the higher than in the lower educational group. In the most recent research period (2004–2005) immediately following the tax cuts, consumption increased sharply among men in the lowest educational group, and the differences between educational groups had disappeared. Among women, on the other hand, weekly consumption of five units or more was reported most often in the highest educational group even in the last time period (Helakorpi et al. 2005).

A panel study conducted to determine the breakdown of this increase in consumption failed to produce any conclusive evidence that the change in alco-

Figure 1. Age-adjusted proportion of persons aged 25–64 who had drunk at least 8 (men) or 5 (women) units of alcohol during the past week by relative education (educational tertiles) in 1982–2005.



Source: Helakorpi et al. 2005.

hol consumption was directly associated with income. Among men, the sharpest increase was admittedly observed in the two lowest income brackets (out of nine), but the difference in the change compared to other groups was not statistically significant (Mustonen et al. 2005).

Educational differences in alcohol consumption were also studied using a smaller dataset representing one time point, but providing more detailed information: this was the Drinking Habits Survey 2000 by STAKES. In this dataset, education was based on register sources and classified into three categories (lowest = primary school or unknown, intermediate = secondary level, highest = lowest level tertiary education or more). The impact of the different age structures in these groups on drinking was controlled by age standardisation.

In the Drinking Habits 2000 material, the mean number of annual drinking occasions was highest in the highest educational group, among both men and women. Educational differences in annual consumption were not as systematic. The proportion of heavy users, the frequency of binge drinking, and the frequency of drinking large quantities at a time, on the other hand, were highest in the lowest educational group (Table 1).

Table 1. Age-adjusted averages and percentages describing alcohol use by educational group (lowest = primary school or unknown, intermediate = secondary level, highest = lowest level tertiary education or more) among men and women aged 25–64 in the Drinking Habits 2000 survey.

	Men			Women		
	Lowest	Intermediate	Highest	Lowest	Intermediate	Highest
Consumption frequency, times per year	69	77	98	34	43	49
Annual consumption, cl per year	691	615	642	208	184	175
Heavy consumption [1], %	7.4	3.7	4.9	6.7	3.5	3.8
Frequency of binge drinking [2], times per year	11.3	8.9	8.0	3.8	2.5	1.6
6+ units [3] weekly, %	19.0	14.3	12.4	4.6	4.1	1.0
6 + times [3] per year	18.0	16.7	13.9	6.0	6.2	3.3
8 + times [3] per year	20.4	15.0	13.3	4.9	2.1	1.5
13 + times [3] per year	10.9	7.4	4.9	2.2	0.3	0.1
18 + times [3] year	3.7	3.3	1.6			
N	197	324	231	179	286	267

[1] Heavy users were defined as the heaviest 5 per cent of men and women drinkers.
[2] Number of times that the respondent has drunk so much that 'it really feels'.
[3] For example, 6+ units and 6+ times: drinking occasions when the respondent has consumed at least six units of alcohol.

Young people

The proportion of young abstainers has increased in the 2000s. According to the 2003 Adolescent Health and Lifestyle Survey, half of all young people aged 14 did not drink at all. Binge drinking and the numbers who drank at least once a month also decreased among young people aged 14 and 16. By contrast no decrease was recorded in drinking among boys aged 18, and among girls aged 18 alcohol use and binge drinking increased through to 2003 (Rimpelä et al. 2003). In the aftermath of the changes in 2004, abstention continued to increase and the frequency of drinking continued to decrease among children in upper comprehensive school, but the declining trend of binge drinking levelled off. Among older schoolchildren, the decline in alcohol use ended and binge drinking increased especially among boys (Rimpelä et al. 2005).

Lintonen et al. (2000) found that monthly binge drinking among children aged 14 was associated with guardian's education: among daughters of parents with no more than a comprehensive or secondary education, the proportion of binge drinkers was one and a half times greater than among the daughters of parents with a higher education. This association remained constant throughout the 1980s and 1990s. Among boys, no such educational difference was observed. However, the ESPAD measurements in 1999 and in 2003 suggest that in boys, too, guardian's education is beginning to have a distinguishing effect: in 2003 15 per cent of boys whose parents have a tertiary education and 22 per cent of those whose parents have no more than a basic education had drunk at least 6 units of alcohol at a time on several occasions during the previous month. Among girls, the corresponding proportions were 8 and 17 per cent (Ahlström et al. 2004).

Differences in alcohol consumption are even greater when comparisons are made according to adolescents' own school achievement. In 1997, 13 per cent of boys with above average school achievement reported that they binge drank several times a month, among boys with lower than average school achievement the figure was 39 per cent. Among girls the corresponding figures were roughly the same, i.e. 12 per cent and 37 per cent (Ahlström et al. 1997). Differences in alcohol consumption by young people's own education are clear as well (Table 2). Among boys and girls in the second grade of upper secondary school, 6 per cent and 2 per cent, respectively, reported that they binge drank once a week, while the figures for vocational school students of the same age were 16 per cent and 5 per cent, respectively.

Table 2. Frequency of binge drinking (%) among young people in the School Health Promotion Survey 2000.

	Comprehensive school 8th grade		Comprehensive school 9th grade		Upper secondary school 1st grade		Upper secondary school 2nd grade		Vocational school 2nd year	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Once a week	7	4	8	4	5	2	6	2	16	5
1–2 times a month	17	19	24	21	22	16	26	16	33	24
Less often	30	33	37	43	43	51	46	57	40	55
Never	46	44	31	32	30	32	22	25	12	16
N	11 901	11 717	11 831	11 735	5 512	7 672	4 863	6 628	3 537	2 658

Source: STAKES. School Health Promotion Survey 2000

Population aged 65 or over

The Health Behaviour and Health among the Finnish Elderly (EVTK) survey data compiled by the National Public Health Institute provides a useful source for monitoring alcohol consumption in the population aged 65 or over. Figures on weekly alcohol consumption are based on self-reported consumption of different beverage types in a postal questionnaire survey. The proportion of abstainers in the elderly population has decreased from 1985 to 2005. In the age group 65–79 there has been a clear increase since the mid-1980s in the proportion of men who drink at least eight units of alcohol a week and in the proportion of women who drink at least five units of alcohol a week (Sulander et al. 2004, Sulander et al. 2006). Men have drunk more alcohol than women throughout the follow-up period. According to the data from the EVTK survey in 2005, 31 per cent of men and 16 per cent of women aged 65–84 reported drinking at least once a week, but not daily. The number of abstaining men decreased and the number of men aged 65–69 who drank spirits increased from 2003 to 2005 (Sulander et al. 2006).

The educational differences in alcohol consumption are very clear. The proportion of men drinking at least eight units of alcohol a week and the proportion of women drinking at least five units of alcohol a week is higher in groups with a higher education. Women aged 65 or over with less education still drink very little. Both men and women who have less education abstain from alcohol significantly more often than those who have more education. Although alcohol use in the elderly population has been at a very low level over the past couple of decades, consumption figures have steadily increased (Sulander et

al. 2006). According to the EVTK survey in 2005, the cut in alcohol taxes has so far had no significant effect on average alcohol consumption in the elderly population.

Discussion

Drinking has increased significantly in Finland since the 1980s. In 2004, consumption jumped by 10 per cent in the wake of lowered prices and increased availability, and has since then remained at this elevated level. Men continue to drink much more than women, although in recent decades women's alcohol consumption has increased more sharply in relative terms. It seems that the rise in consumption in 2004 was particularly marked among men with the lowest level of education. Alcohol-related deaths also increased most in the lowest socio-economic groups.

Overall, alcohol consumption is quite evenly distributed between the different socio-economic groups, when measured in terms of annual consumption or the proportion of respondents who drink a certain amount of alcohol a week. However, indicators that are more closely linked to adverse effects of alcohol, such as binge drinking and heavy consumption, are somewhat more prevalent in lower socio-economic groups, both among men and women.

As for the more severe adverse effects of alcohol consumption, such as alcohol-related deaths and hospital admissions, the evidence is that these are several times more common in lower than in higher socio-economic groups (Mäkelä 1999, Mäkelä et al. 2003, Mustonen and Simpura 2006, Herttua et al. 2007). Indeed, it has been found that alcohol-related deaths account for one-quarter of the life expectancy difference between blue-collar and upper white-collar men, and for 50 per cent of the mortality difference between these groups in accidental and violent deaths (Mäkelä et al. 1997).

The socio-economic differences revealed by questionnaire studies in binge drinking and heavy consumption are much less pronounced than the differences in alcohol-related harms. To some extent the differences between questionnaire surveys and register-based research may be due to the fact that consequences of the same level of alcohol consumption may indeed be worse in lower socio-economic groups. For instance, people in higher socio-economic groups may have better resources to reduce their consumption if and when symptoms present themselves, and they may also be better motivated to effect a change if they are faced with the risk of, say, losing their job. Furthermore, men in higher socio-economic positions more often have a family, so it is possible that they have more ready access to support from family and significant others as they try to change their drinking habits.

Another factor contributing to the differences between questionnaire surveys and register data is the lacking external validity for questionnaire data. The homeless and institutionalised population are completely excluded from questionnaire survey samples, and the number of heavy consumers in this population is higher than normal. Furthermore, non-response rates in questionnaire surveys today are often around the 30 per cent mark, and heavy drinkers are overrepresented among dropouts. This is one reason why questionnaire studies cover only part of total alcohol consumption. Perhaps an even more important reason is that virtually all respondents in these surveys underestimate their consumption. Registers on alcohol-related deaths and hospital admissions, on the other hand, cover all deaths and all people treated at hospital, which eliminates the selection problem. In spite of these inherent problems with questionnaire surveys, the trends reported here can be assumed to be relatively reliable, since response rates in both the AVTK and EVTK surveys have been almost unchanged for the past ten years.

It is no longer possible, to the same extent as before, to rely on the old alcohol policy tools of high prices and restrictions on availability to prevent and contain alcohol-related harms. Instead, action is now needed on many different fronts, applying a variety of different and new methods that are thought to yield the best results in the groups that are most affected by these harms, i.e. the lowest socio-economic groups (see also Mäkelä et al. 2002).

It is important that the problems of binge drinking, heavy alcohol consumption, and alcohol-related harm are tackled at the local level. Every effort must be made to sustain and encourage the favourable trends that were seen in the early 2000s in young people's alcohol consumption (although those trends were partly halted or, according to some data, even reversed by events in 2004) through the cooperation of parents, schools, school health care and other local institutions. The methods of early intervention must be more widely adopted in health care, and they can also be applied in public health education. Adequate treatment must be made available for alcohol problems in local municipalities, and municipal health and social services must allocate resources to supporting families of people with substance abuse problems and to provide treatment for pregnant mothers with substance abuse problems so as to break the chain of 'inheritance' of alcohol problems over generations. Alcohol taxes should be moderately increased. Sufficient resources should be allocated to preventing sales of alcohol to minors and drunken customers, and restaurants should develop their own mechanisms of control. One of the most direct ways to address the challenge of socio-economic differences is by means of health education and health monitoring in vocational institutions and among young people excluded from secondary education.

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4.1.4 Dietary habits

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Working-age population

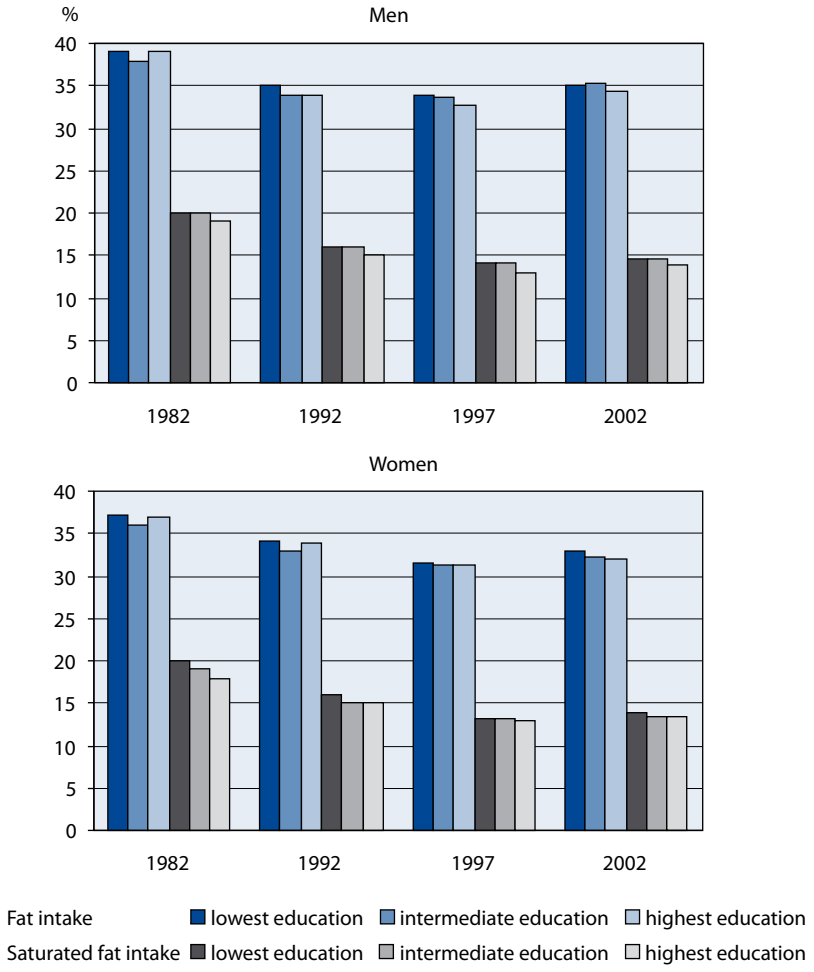
This section provides an overview of socio-economic differences in dietary habits in the Finnish population of working age and looks at how those differences have changed over time. Most of the research on dietary habits has described socio-economic differences between educational groups, and the same applies to this review. Comparisons are always easier when dietary habits are examined against the same indicator of socio-economic position. Similar differences in dietary habits have been reported when using occupational and income classifications, but these are not discussed separately here.

Dietary habits are here examined against the following factors related to nutrients and eating: energy-producing nutrients, sources of saturated fat, consumption of vegetables, compliance with current dietary recommendations, and meal patterns. All of these areas are highly significant to public health and the prevention of diseases. This choice was also influenced by current nutrition recommendations (Finnish Nutrition Recommendations 2005, 1998), which are intended to promote the good health of Finnish people by improving their diet.

Energy-producing nutrients

Energy is obtained from fat, carbohydrates, protein and alcohol. The Finnish diet today has too heavy content of fats, especially saturated or hard fats, and too low content of complex carbohydrates. The intake of energy nutrients in the Finnish population of working age has been monitored in 1982, 1992, 1997 and 2002 in a series of studies on the nutritional quality of diet in Finland (Findiet). Data on nutrient intake have been collected by a three-day food record (in 1982 and 1992), an interview on nutrient intake during the previous day (in 1997), and an interview on nutrient intake during the two previous days (in 2002). In each of these years the differences in energy intake have been marginal in different educational groups (Kleemola et al. 1996, Findiet Study Group 1998, Männistö et al. 2003). The intake of fat and saturated fat as a proportion of total energy intake has progressively decreased during the period under review, but that proportion has not varied by educational group (Figure 1).

Figure 1. Intake of fat and saturated fat as percentage of total energy intake in male and female educational groups in 1982, 1992, 1997 and 2002 in the KTL Findiet studies.



Sources of saturated fat

High levels of saturated fat in the diet increase the risk of cardiovascular disease and type 2 diabetes. Major sources of saturated fat used to include milk, butter and meat dishes, today saturated fats come mainly from cheese, meat dishes and dietary fats (Männistö et al. 2003).

According to the Health Behaviour and Health among the Finnish Adult Population Survey results from the early 1980s, a larger proportion of both

men and women in the lowest educational group used butter as spread on their bread than men and women in the highest educational group. The use of butter as spread on bread decreased in the late 1980s in all educational groups. At the same time, educational differences in the use of bread spreads narrowed among men and disappeared altogether among women (Helakorpi et al. 2003). The same trend was observed in the Findiet study, where the consumption of butter in grammes has been measured by using food records. In 1980, people in the highest educational group still used to eat much less butter than in other educational groups, but in 1992 the educational differences had decreased among men and disappeared among women (Kleemola et al. 1996).

The educational differences in eating cheese are opposite to those seen with butter. The higher the level of education, the higher the consumption of cheese (Kleemola et al. 1996). This pattern was first observed in the early 1980s and was still in evidence in the mid-1990s (Valsta et al. 2000).

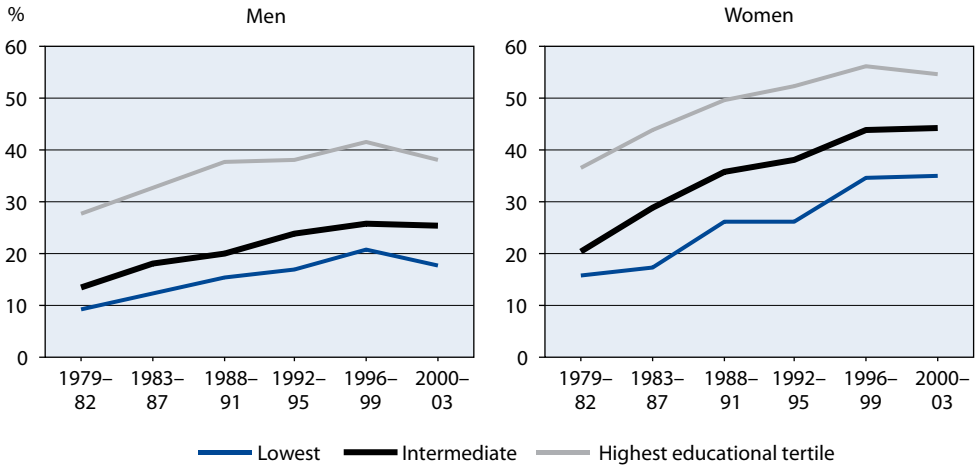
Based on evidence from dietary diaries, the sources of saturated fat vary by educational group, but no educational difference is seen in the intake of saturated fat as a percentage of total energy intake. The sources of fat intake change over time and at a different pace in different educational groups. (Roos et al. 1995, Roos 2000.)

Consumption of vegetables

The daily diet should include plenty of vegetables, and current recommendations are that their consumption should be substantially increased (Finnish Nutrition Recommendations 2005). Vegetables provide carbohydrates, fibre, and lots of vitamins and other health-enhancing substances, but they are low on energy, fat and protein.

Vegetable consumption has continued to increase since 1979, but educational differences in the daily consumption of vegetables remain clear (Figure 2). The higher the educational group, the higher the number of men and women who report a daily consumption of vegetables. However, the proportion of people who consume vegetables daily has increased in all educational groups in the 1980s and the 1990s (Helakorpi et al. 2003). People with a high level of education consume vegetables not only more often but also in larger quantities than people with less education (Kleemola et al. 1996, Valsta et al. 2000). In 1992, for example, the daily consumption of vegetables among people in the highest educational group was 30 grammes higher than in the lowest educational group.

Figure 2. Age-adjusted percentage of people aged 25–64 who eat fresh vegetables daily by relative education (educational tertiles).



Source: Helakorpi et al. 2003

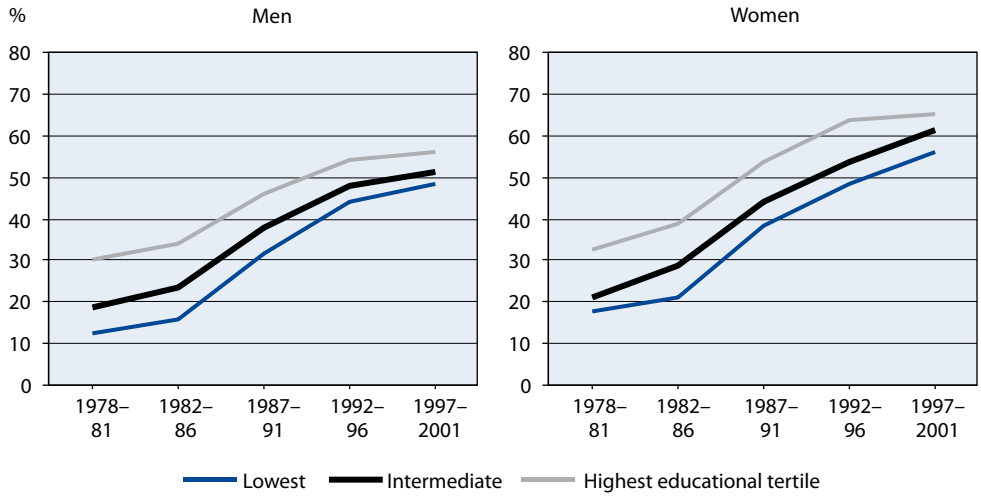
Dietary recommendations

The proportion of individuals whose diet complies with current nutrition recommendations (who consume vegetables daily and who avoid saturated fats) is clearly largest in the highest educational group (Figure 3). This has been confirmed in a number of studies (Helakorpi et al. 1998, Roos et al. 1998, Prättälä et al. 1992). It seems that the highest educational group is the first to take these dietary recommendations on board; other groups follow their examples some five years later (Prättälä et al. 1992). Compliance with dietary recommendations has been widely used in research as a measure of healthy diet. However, it is somewhat problematic to compare different indices over time because not only do the indices themselves change, but so too do the dietary recommendations. However, regardless of the study and the point of measurement, people in the highest educational group comply more closely than others with the recommendations in force at that time point. On the basis of this evidence alone, it is difficult to say for sure whether the educational differences in healthy dietary habits have changed.

Socio-economic differences in meal patterns

Some concern has been voiced in Finland over the traditional meal pattern of breakfast and two hot meals being ousted by a culture of irregular snacking. It

Figure 3. Age-adjusted percentage of healthy dietary habits* in the population aged 25–64 by relative education (educational tertiles).



*Three out of four alternatives: vegetables daily, avoids fatty milk, does not use butter or mixture of butter and vegetable oil, eats at least 6 slices (men) / at least 5 slices (women) of bread per day

Source: Helakorpi et al. 2001

is feared that this trend will result in a less balanced diet, the choice of snacks with poor nutritional content, a habit of nibbling, difficulties with weight control and increasing caries. Indeed, in the light of current knowledge, the rhythm of three regular meals is considered optimal for good health (Finnish Nutrition Recommendations 2005).

The meal pattern is influenced by a host of social factors, including changes in the worklife. Since the 1920s, the meal pattern in Finland has changed from one based on four hot meals (including breakfast) through three hot meals to the current pattern of two hot meals a day. These changes have their background in industrialisation, urbanisation, the entry of women into wage employment, and various other structural changes in society.

Educational differences in meal patterns in Finland are not very pronounced, although some minor differences can be detected in eating breakfast, in the number of hot meals, and in the choice of where lunch is taken. Just under half of Finnish men eat a hot meal both for lunch and dinner; there are no educational differences. Among women, on the other hand, only one-third have a hot meal at lunch and dinner, and women with the highest education have only one hot meal a day more often than women with the lowest education (AVTK 1986–2004).

People with the highest education took their lunch at a staff canteen more often than other educational groups throughout the review period (AVTK 1980–2001). People with the lowest education, on the other hand, took their lunch more often than others at home or skipped lunch altogether. The differences between educational groups have remained virtually unchanged for the past 20 years (Raulio et al. 2004).

There are no major educational differences in the frequency of eating breakfast. However, the proportion of people who had eaten breakfast was slightly higher in the highest than in the lowest educational group throughout the period reviewed. The educational differences narrowed among both men and women in the 1990s, but in the 2000s they have increased again among women (AVTK 1986–2004). At the beginning of the 1988–1995 period, people with the highest education had both breakfast and lunch more often, but dinner less often than people with the lowest level of education. At the end of this period, the educational differences had almost disappeared among men, but remained unchanged among women (Mäkipää 1998).

Young people

There is only fairly limited research into socio-economic differences in food use among young people, and most of that work is cross-sectional. It has been found that children of parents with the highest level of education eat more vegetables (Hirvonen et al. 1999, Roos et al. 2001, Haapalahti et al. 2003) and fruit (Laitinen et al. 1995, Hirvonen et al. 1999) than children of parents with less education. In the study by Laitinen et al. (1995), parental education was associated with children's fruit and berry consumption, but not with vegetable consumption. If in the young people's own assessment the family was suffering financial hardship, the daily consumption of fresh vegetables was lower than when the family's financial situation was considered sound (Hirvonen et al. 1999, Roos et al. 2001). Children of parents with the lowest level of education have been found to consume more butter and whole milk and less margarine and skimmed milk than children of parents with a higher education (Laitinen et al. 1995, Haapalahti et al. 2003). In particular, children of farmers use more butter than children of white-collar workers (Laitinen et al. 1995).

Laitinen et al. (1995) reported that the total energy intake of young people was at roughly the same level regardless of father's education or family income. By contrast the intake of fat was higher among farmers' children (40% of total energy intake) than among children of blue-collar workers (37–38% of total energy intake). The quality of fat consumed was also more detrimental to health

in farmers' children than others, and the ratio of polyunsaturated to saturated fatty acids was by far the highest among children of parents with a higher education (Laitinen et al. 1995).

According to the data collected for the School Health Promotion Study, the fast food index (which describes the frequency of consuming burgers, pizza, soft drinks and sweets) was associated with other adverse health habits such as smoking, but not with parental education or the family's financial situation (Hirvonen et al. 1999). Children of parents who had an academic education consumed recommended foods (fruit, vegetables, rye bread and fermented milk products) more often than children of parents who had completed no more than comprehensive school (Roos et al. 2004). Parental education was not associated with the frequency of eating fast food or sweets. This association of healthy choices with parental level of education has also been observed in children aged 10–11 (Haapalahti et al. 2003).

The population aged 65 or over

There is very little existing research into the dietary habits of older people, and particularly their socio-economic differences, both in Finland and elsewhere. According to survey data compiled every other year by the National Public Health Institute, educational differences in dietary habits have remained unchanged from the 1990s to the 2000s (Sulander et al. 2004). The consumption of fat, skimmed milk, vegetables and fruit has been closer to the recommended levels in the higher as compared to the lower educational group. However, this difference has begun to level off in recent years. A follow-up study using data compiled by the National Public Health Institute showed that healthy dietary habits have increased very sharply from the mid-1980s to the present day (Sulander et al. 2003). The same study revealed clear differences in the dietary habits of different occupational groups. Healthy dietary habits were most common among pensioners who had a background in office work, whose educational level was clearly higher than in other occupational groups. Compliance with dietary recommendations was least common among former agricultural workers. Nevertheless, healthy eating increased clearly in all occupational groups.

Discussion

Dietary habits vary in different socio-economic groups of the population. However, differences in nutrient intake have been far less pronounced than differences in the consumption of foodstuffs. The sources of saturated fats and

other nutrients also vary by socio-economic status. Overall, dietary habits have improved over the past two decades, but the socio-economic differences in those habits continue to remain. The differences are most marked in the consumption of vegetables, which is higher in the highest socio-economic groups. These differences are further accentuated by differences in meal patterns, such as taking lunch at a workplace canteen. The differences among young people and the elderly population follow the same general trend as differences in the adult population.

Overweight and obesity related to nutrition level are discussed elsewhere in this report (Reunanen et al. 4.2 in this report). Suffice it to note here that there are marked socio-economic differences in overweight and obesity (Lahti-Koski et al. 2000). These differences cannot be explained simply by reference to differences in energy intake, because the achievement of energy balance is dependent not only on nutrition but also on everyday physical activity. Socio-economic differences in everyday physical activity are discussed in the next section of this chapter (Borodulin et al. 4.1.5).

Socio-economic differences in dietary habits have changed very little during the past two decades. However, differences in the type of bread spread used have narrowed considerably, and among women they have actually disappeared altogether. There is no research evidence to indicate which measures have contributed most to reducing these differences, but the change is probably the outcome of general nutrition education and with conscious and unconscious policy actions (Prättälä et al. 2002), in pricing, tax and agricultural policy. It seems that the most effective approach to reducing socio-economic differences in nutrition intake is traditional universalism, i.e. targeting the whole population groups rather than just the most deprived groups. In practice this means continuous and increasing support to school and kindergarten canteens, national nutrition recommendations, and extensive health promotion campaigns. However, it might also prove effective to undertake universalistic measures that are targeted to the whole population but that are particularly beneficial to low socio-economic status groups. One example might be provided by the use of pricing and agricultural policy tools to keep the prices of vegetables at an affordable level.

Future efforts to reduce socio-economic differences should combine national policy measures with municipal-level measures as well as NGO actions. The Government is a key player in determining the price and availability of food and in issuing national nutrition recommendations. Municipal authorities play a key part in the provision of meal services, while NGOs have a central role in designing and implementing health promotion programmes (Prättälä et al. 2002).

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4.1.5 Physical activity

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Working-age population

There is comparatively little research in Finland on socio-economic differences in physical activity among people of working age and a scarcity of population-level evidence on how these differences have changed. Some studies have been published on socio-economic differences in leisure time physical activity, but these are usually based on regional or otherwise limited datasets. Furthermore, measurements of physical activity are generally rather crude, making it impossible to analyse the frequency, duration and intensity levels of different types of physical activity.

The results on how socio-economic differences have changed are thus incomplete and to some extent even contradictory, depending on the research materials and the methods of measurement used. However, based on the evidence accumulated so far, it is reasonable to assume that high socio-economic status, whether measured in terms of education, occupational status or income level, is associated with physical activity, conditioning physical activity, commuting activity, and aerobic fitness (Lakka et al. 1996, Helakorpi et al. 2003, Borodulin et al. 2006).

Results from the Health Behaviour and Health among the Finnish Adult Population (AVTK) surveys by the National Public Health Institute show that leisure time physical activity in the population aged 15–64 has increased. In 1978 some 40 per cent reported leisure time physical activity at least twice a week, in 2004 the corresponding figure was over 60 per cent (Helakorpi et al. 2004). Leisure time physical activity among both men and women has increased in all educational groups since the late 1970s onwards, but men in the highest educational group were physically active more frequently than men in the lower educational groups, and these educational differences have remained unchanged throughout the period under review. For women, no corresponding difference was observed between educational groups. (Helakorpi et al. 2003.) Studies on leisure time physical activity in eastern Finland have shown that activity increased more in the lower educational and income categories than in the highest categories (Marti et al. 1988). The amount of daily physical activity in the form of walking or cycling to work decreased in the early 1990s, but has since remained more or less unchanged (Helakorpi et al. 2004). No compara-

tive studies have been conducted on changes in socio-economic differences in commuting or occupational physical activity.

Young people

Several studies have investigated the associations of socio-economic factors with physical activity among children and adolescents. Most typically, socio-economic status is measured in these studies by reference to parental occupation, education and income level, and physical activity by reference to the amount or intensity of leisure time physical activity. The results suggest that low socio-economic status of childhood family is associated with a low level of physical activity and participation in organised sports (Telama and Laakso 1983, Rimpelä et al. 1990, Hämäläinen et al. 2002, Tammelin et al. 2003, Tammelin 2003). Children of farmers and unskilled workers participate in organised sports less often than others (Telama and Laakso 1983, Rimpelä et al. 1990). However, there are also conflicting results which show no association between family's socio-economic status and physical activity or its intensity (Hämäläinen et al. 2002, Tammelin 2003).

Young people with a low level of school achievement and student drop-outs engage less in physical activity (Aarnio 2002, Tammelin 2003, Karvonen and Rimpelä 1997) than those following or planning a longer educational path (Hämäläinen et al. 2002). Comprehensive school and upper secondary school students are more physically active than vocational school students (Aarnio 2002). It has been found that poor school achievement is associated with a low level of physical activity in later life as well (Hämäläinen et al. 2002). Indeed it seems that education and school achievement are more important determinants of physical activity in adulthood than family background (Tammelin 2003, Tammelin et al. 2003).

It is widely known that leisure time physical activity among young people has increased in the past few decades (Vuori et al. 2004), but there has been no work to study how physical activity and socio-economic differences have changed over time.

The population aged 65 or over

Only limited population-level evidence is available on physical activity in the elderly population aged 65 or over and on its socio-economic differences. The measurement of physical activity presents a considerable challenge in this age group as well, as for older people physical activity is often a matter of cop-

ing with daily activities. According to Health Behaviour and Health among the Finnish Elderly (EVTK) surveys, one of the most popular forms of physical activity in the elderly population is walking: about one-half of the population aged 65–84 say they walk at least half an hour every day. Regular walking has been a popular form of activity throughout the EVTK follow-up, and there have been no major changes in the frequency of walking or any systematic differences by educational group. (Sulander et al. 2003.)

In the 2003 EVTK survey, around 15 per cent reported taking some other form of exercise every day (e.g. cycling, swimming, gymnastics, games). The ability to participate in physical activity apart from walking is better in the highest educational group than in the lower educational groups. According to the 2003 results, 20 per cent of women in the lower and 8 per cent in the higher educational group say they do no other physical activity apart from walking. For men, the corresponding figures are 15 per cent and 5 per cent. Although there is only limited population-level evidence about conditioning physical activity among the elderly, the result concerning the frequency of walking in all socio-economic groups is encouraging. (Sulander et al. 2003.)

Discussion

Higher education is associated with more active participation in physical activity. The research evidence on the frequency, amount and intensity of different types of physical activity in different socio-economic groups is too thin to draw any firm conclusions.

In recent decades there have been marked changes in people's involvement in physical activity: leisure time physical activity has increased, and at the same time occupational physical activity has continued to decrease. Increasing numbers have moved to densely populated urban areas where opportunities for physical activity are very different from those in sparsely populated areas. Perhaps the single most significant change is the decrease in occupational physical activity, because in the wake of automation, work has continued to become physically ever lighter. This applies most particularly to the population with the lowest level of education, who have traditionally had physically demanding jobs. On the one hand, the lowered physical demands in the workplace have contributed to less adverse working postures and improved overall ergonomic standards, but on the other hand they have lowered the level of energy consumption and thus increased the risk of weight gain. It would seem that the current level of leisure physical activity is not enough to compensate for the risk of overweight resulting from the decrease in work-related physical activity in the adult population (Fogelholm et al. 1996, Borodulin et al. 2007).

The increase in leisure time physical activity is beneficial from a public health point of view, and there is reason to assume that this increase in leisure time physical activity is spread evenly across all socio-economic groups. Nevertheless about one-third of the population is physically inactive. It would be useful to know to which groups these inactive people mainly belong so that they could be more effectively targeted in health and physical activity policy planning. In addition, research is needed to investigate the variation in occupational physical activity and different types of leisure time physical activity (various forms of physical activity vs. daily physical activity) in different socio-economic groups and to explore the possible changes that have happened by age group so that the impacts of physical activity policy measures could be reliably evaluated (Ministry of Education 2005).

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4.1.6 Summary and conclusions on changes in health behaviour

Ritva Prättälä

Higher socio-economic groups in Finland generally adhere to healthier lifestyles than other socio-economic groups. However, the socio-economic differences in lifestyles and health behaviour are not entirely consistent. Table 1 provides an overview of our current knowledge. Since we have chosen to describe socio-economic position primarily by reference to education, the summary data are also organised according to this indicator. Other socio-economic differences, insofar as they were described above, are generally consistent with educational differences. Indeed the discussion below deals with socio-economic differences in general.

Table 1. Unhealthy lifestyles that are more prevalent in men and women with a low education in the working-age population, young people and the elderly population: summary.

Lifestyle	Working-age population		Young people		Elderly population	
	Men	Women	Men	Women	Men	Women
Smoking						
Daily smoking	Y ▶	Y ▶	Y	Y	ns.	ns.
Onset	Y	Y	?	?	?	?
Cessation	Y	Y	?	?	?	?
Drinking						
Heavy consumption	Y	Y	?	?	?	?
Binge drinking	Y	Y	Y	Y	?	?
Dietary habits						
Use of butter	Y ◀	Y ◀	Y ◀	Y ◀	Y ◀	Y ◀
Vegetables/fruits/berries	Y	Y	Y	Y	Y ◀	Y ◀
Healthy dietary habits	Y	Y	Y	Y	Y	Y
Lunch in the workplace	Y	Y	?	?	?	?
Physical activity						
Low level of leisure time physical activity	Y	ns.	Y	Y	ns.	ns.
Mobility	?	?	?	?	Y	Y

Y unhealthy behaviour more common among people with a low education
Y▶ unhealthy behaviour more common among people with a low education and educational difference increasing
Y◀ unhealthy behaviour more common among people with a low education but difference is decreasing
ns. no difference between people with a low and high education (not significant)
? unknown

In the working-age population, smoking is less prevalent in higher than lower socio-economic groups. The pattern is similar among young people. The variation is particularly sharp according to the young individual's own education or school achievement: smoking is twice as common among vocational school students as among upper secondary school students. Socio-economic differences in smoking have increased in recent decades. (Laaksonen et al. 4.1.2 in this report)

Among people of working age, heavy alcohol consumption and binge drinking are more common in lower socio-economic groups. No corresponding data are available for older people aged 65 or over, but the proportion of men who drink eight units and women who drink five units a week or more is higher among people with more education. Among young people, too, drinking varies according to either the young person's own or his/her parents' socio-economic position. Binge drinking is more common than average among young people with low school achievement and among vocational school students. (Helakorpi et al. 4.1.3 in this report)

People in high socio-economic groups eat vegetables or berries and fruit more often and butter less often than those in lower socio-economic groups, and their dietary habits overall are more closely in line with current recommendations. The differences follow a similar pattern among young people and the elderly. The development of dietary habits in different population groups has differed from that seen in the case of smoking. At the same time as dietary habits overall have become healthier, socio-economic differences have narrowed, at least as far as fat consumption is concerned. Having said that, the research evidence on how the differences have changed is relatively scarce and to some extent contradictory. No comparative data are available on the dietary habits of vocational school and upper secondary school students (Roos et al. 4.1.4 in this report).

There is a relative paucity of data on socio-economic differences in physical activity and how these have changed over time. In the working-age population, people with a high socio-economic position participate more in physical activity during their leisure time than others. Young people with a low socio-economic position or with low school achievement engage in leisure time physical activity less often than others, and vocational school students are less physically active than upper secondary school students. In the population aged 65 or over, those with a higher education have better possibilities than those with a low education to engage in other forms of physical activity than walking, but no other socio-economic differences have been found (Borodulin et al. 4.1.5 in this report).

The results for Finland do not differ much from those reported in other countries. Several European studies have discovered marked socio-economic differences in smoking (Puska et al. 2003, Giskes et al. 2005). There is only limited research on how socio-economic differences in smoking have developed, but the results suggest that in some European countries those differences are now increasing and in others decreasing. Apart from Finland, evidence of increasing differences has also been reported in Sweden, Denmark, Germany and Italy (Giskes et al. 2005).

The results on alcohol consumption in Finland are also consistent with the European evidence. Based on questionnaire and interview responses to items on the frequency of drinking, it seems that high socio-economic status individuals tend to drink more often than those in a low socio-economic position. Heavy use or binge drinking, on the other hand, are more common in lower socio-economic groups (Hupkens et al. 1993, Helasoja et al. 2007).

It appears that socio-economic differences in dietary habits follow a different pattern in southern and northern Europe. In Finland, the differences are similar to those seen in other northern European countries. A survey covering more than ten EU countries revealed marked socio-economic differences in vegetable consumptions in northern and central Europe, but only minor differences in Mediterranean countries. The use of butter and whole milk varies by socio-economic status in northern Europe. In Mediterranean countries the use of butter on bread is so rare that it is impossible to detect eventual socio-economic differences. The socio-economic differences in the use of cheese, on the other hand, are fairly consistent: in all countries, cheese consumption is higher in higher socio-economic groups. (Roos et al. 2000, Prättälä et al. 2003.) European studies have discovered socio-economic differences in leisure time physical activity, too: people in higher socio-economic status groups are physically more active than others (Martinez-Gonzalez et al. 2001, Inchley et al. 2005).

The socio-economic differences detected in smoking, alcohol use, dietary habits and physical activity in the Finnish population are such that they may serve to maintain and increase health inequalities. Socio-economic differences in lifestyle are found in all age groups, but most often in the working-age population, partly perhaps because most of the research evidence concerns these age groups. Men of working age represent the most problematic group: in their case all the living habits reviewed vary by socio-economic position. The biggest socio-economic mortality differences are also found among working-age men. Socio-economic differences in lifestyles are very consistent in working-age women, too.

Socio-economic lifestyle differences are least consistent in the elderly population aged 65 or over. Among young people, the most striking difference is that seen between the lifestyles of vocational school students and upper secondary school students, which are considerably healthier in the latter group. However, the research on these differences is still relatively scarce. Even less data are available on the small group of young people who drop out of education after comprehensive school. In the light of what we know today, it would be extremely important for reasons of health equality to try and encourage healthier lifestyles among those who opt for a shorter educational career or who have poor school achievement.

The results on smoking and dietary habits provide some useful insights for planning interventions designed to reduce health inequalities. Educational differences in smoking are not only consistent, but also increasing. Dietary habits, on the other hand, provide an example of a positive trend in development: socio-economic differences in the use of butter have decreased, and there are indications of a similar tendency in the consumption of vegetables, too. These changes are enough to persuade us that the differences are not irreversible, but that it is possible to narrow them down. What we now need to do is analyse in closer detail what has caused the socio-economic differences in smoking to increase and what has caused the differences in dietary habits to decrease. Are the same social and cultural processes at work in both cases, or are the underlying factors different?

In order to reduce mortality and morbidity differences, it is particularly important to try and prevent lifestyle differences from arising, i.e. to make sure that efforts to promote the adoption of healthy behaviours are targeted at children and young people. Unfortunately, the research results from the turn of the millennium suggest that unless effective measures are put into place, the adverse health effects of smoking, binge drinking and other unhealthy habits will increasingly be concentrated in low socio-economic groups.

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4.2 Biological risk factors

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Although the exact pathogenesis of most chronic diseases is still unknown, there are quite a large number of individual and environmental factors that are known to increase the risk of illness. Amongst these factors, biological risk factors refer to physiologically, structurally and biochemically determined factors at the individual level. Many of these factors are determined genetically, but the level of very many biological risk factors is dependent on various lifestyles. Lifestyles, then, differ on average between different socio-economic groups.

The main focus in this section is on the major biological risk factors for circulatory diseases and type 2 diabetes. Several hundred risk factors have been identified for circulatory disease, but by far the important are thought to be high blood pressure, high blood lipid content and smoking. Diabetes, on the other hand, is known to considerably increase circulatory disease morbidity. The most unequivocal risk factor for adult-onset type 2 diabetes, the most common type of diabetes, is obesity. The following therefore describes the results from Finnish population surveys on socio-economic variation in blood pressure, blood lipid content and obesity. Smoking, a well-established risk factor for many chronic diseases, is discussed in connection with health behaviour elsewhere in this report (see Laaksonen et al. 4.1.2).

The level of risk factors is described separately by reference to the results of the FINRISK study and the results of the Health 2000 Health Examination Survey. The decision was made to review these results separately because they used different samples and different methods.

FINRISK study

The FINRISK study is a population survey conducted by the National Public Health Institute once every five years. Using standardised methods, it has been designed to investigate the key risk factors for cardiovascular diseases in the population aged 25–64 in specified geographical areas (Salomaa et al. 2003). Representative samples have been collected in 1992, 1997 and 2002 from the former provinces of North Karelia and Kuopio in eastern Finland; from the Turku/Loimaa area in south-western Finland; and from the Helsinki metropolitan area in southern Finland. Table 1 shows the number of participants divided into tertiles of birth cohort according to length of education. Participation rates in the survey ranged from 76 to 65 per cent in different years.

Table 1. Participants[1] in FINRISK studies: number of men and women aged 25–64 by survey year and length of education (educational tertiles).

Survey year and educational group	Men	Women
1992		
Lowest tertile	974	1 099
Middle tertile	946	1 000
Highest tertile	914	1 075
1997		
Lowest tertile	860	937
Middle tertile	880	1 080
Highest tertile	973	973
2002		
Lowest tertile	803	899
Middle tertile	743	866
Highest tertile	790	985

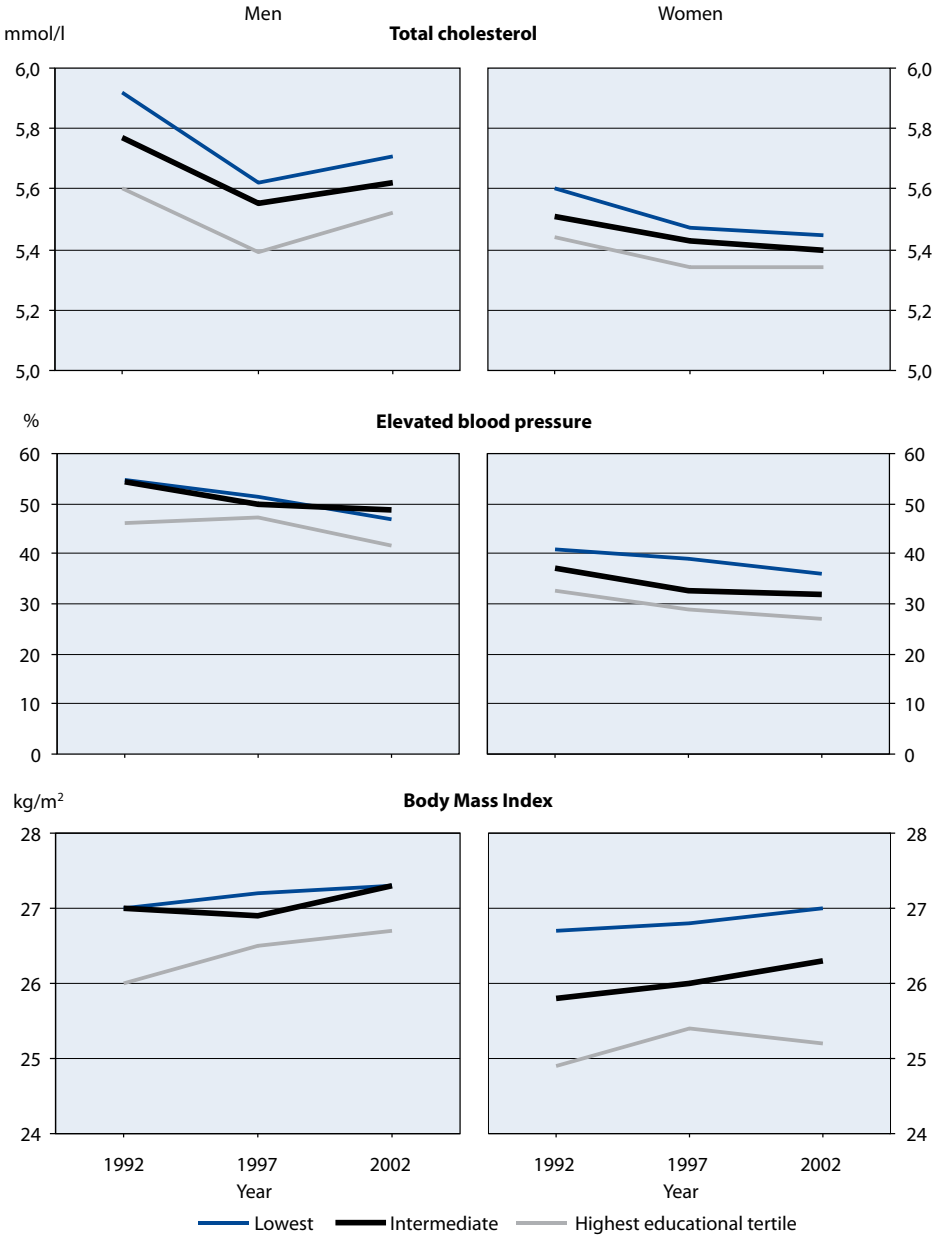
[1] Including the areas of North Karelia, Kuopio, Helsinki and Turku/Loimaa, where the survey was conducted in each of the three years.

Persons with a systolic blood pressure of > 140 mmHg or a diastolic blood pressure of > 90 mmHg or who were on blood pressure medication, were considered to have high blood pressure. Total cholesterol was measured from fresh serum samples using a commercial enzymatic method (CHOD-PAP, Monotest, Boehringer-Mannheim, Germany). Height and weight were measured when subjects were dressed in light clothing without shoes. Body Mass Index (BMI) was calculated by dividing weight by squared height (kg/m^2).

Figure 1 shows the trends for the major biological risk factors in population tertiles grouped according to length of education. Clear and statistically significant ($p < 0.0001$) educational differences were observed in the level of almost all risk factors for both men and women. The only exception was the prevalence of elevated blood pressure for men, where no significant difference was seen. The results for the prevalence of systolic and diastolic blood pressure were consistent with the results for the prevalence of elevated blood pressure.

Women's mean BMI varied considerably by educational group. In 2002, for example, the difference between the lowest and highest educational tertile was 1.8 kg/m^2, which in the case of a woman who is 165 cm tall translates into a weight difference of almost five kilos. No statistically significant changes were seen in the risk factor differences between educational groups in the period under review. In other words the educational differences in biological risk factors have neither decreased nor significantly increased during the period from 1992 to 2002.

Figure 1. Most important risk factors for coronary heart disease (total cholesterol mmol/l, elevated blood pressure = systolic > 140 mmHg or diastolic > 90 mmHg or blood pressure medication, BMI kg/m²) by education for men and women aged 25–64 who participated in the FINRISK studies in 1992, 1997 and 2002 (means or percentages).



Health 2000

The picture drawn by the FINRISK study of the prevalence of risk factors for cardiovascular diseases is usefully complemented by the results of the Health 2000 survey in 2000–2001. Health 2000 was based on a nationally representative sample of Finnish adults aged 30 or over, including the population aged 65 and over. The total sample comprised 8,028 persons (Table 2), of whom 85 per cent took part either in an extensive health examination or a shorter home health examination (Aromaa et al. 2004). Measurements of blood pressure, height, weight and waist circumference were taken in all these participants, and blood samples were collected for the determination of serum cholesterol and other items. Health 2000 also collected data among young people aged 18–29. This sample comprised 1,894 persons, of whom 79 per cent were interviewed. Those who did not take the interview were sent a post-questionnaire that was returned by 11 per cent. Some 90 per cent of the sample responded to the most important interview items.

In the Health 2000 survey, obesity was defined as BMI ≥ 30 kg/m^2. According to the WHO, a waist circumference of 102 cm or more in men and 88 cm or more in women considerably increases the risk of metabolic complications associated with obesity (WHO 1998).

About one-fifth of both men of working-age and older men were obese. Among working-age women, more than one-fifth and among older women almost one-third were obese (Table 3). In all these groups obesity seemed to be more common in lower than higher educational groups, although among men aged 65 or over the educational difference was not statistically significant. About one-third of working-age men and 40 per cent of older men had a high waist circumference. Over 40 per cent of women of working age and two-thirds of older women exceeded the WHO limit value. The results for waist circumference yielded the same result as BMI, i.e. with the exception of men aged 65 or over a clear difference was seen between educational groups.

Table 2. Number of men and women aged 30 or over who participated in the Health 2000 survey by level of education and age.

Education	Men		Women	
	30–64 years	65 + years	30–64 years	65 + years
Basic level	735	439	758	802
Secondary level	983	116	820	165
Higher level	645	57	1 031	103

Table 3. Age-adjusted prevalence (%) of obesity (BMI ≥ 30) and abdominal obesity (waist circumference for men ≥ 102 cm and for women ≥ 88 cm) by educational group (Health 2000).

Education	Men			Women		
	30–64 years	65+ years	30+ years	30–64 years	65+ years	30+ years
BMI ≥ 30 (%)						
Basic level	25.4	23.7	25.3	26.0	34.1	29.0
Secondary level	20.3	15.4	19.6	21.9	26.5	22.9
Higher level	15.2	19.0	15.2	17.8	16.2	17.7
Total *	20.6	21.7	20.7	21.7	31.0	24.0
p	< 0.001	0.227	< 0.001	0.001	0.004	< 0.001
Waist circumference (%)	≥ 102 cm			≥ 88 cm		
Basic level	35.8	41.5	36.9	47.2	69.3	53.5
Secondary level	31.0	37.0	31.9	43.8	59.8	47.9
Higher level	27.8	38.4	29.1	36.3	52.1	40.2
Total *	31.7	40.3	33.2	41.9	66.0	47.6
p	0.004	0.692	0.002	< 0.001	0.003	< 0.001

* Not adjusted for age

For the age group 18–29, the Health 2000 protocol included only a health interview, i.e. no data were obtained from health examinations on height or weight. BMI for young people was calculated on the basis of self-reported height and weight. The same criterion was applied for obesity as in other age groups, i.e. ≥ 30 kg/m^2. The educational classification for young adults differs somewhat from that used with people aged 30 or over. For people under 30 it was assumed that they would eventually graduate from their current training and were allocated to the corresponding educational category. In addition, tertiary education is divided into two parts, i.e. higher vocational education and other higher education.

In the age group 18–29, 8 per cent of men and 7 per cent of women were obese (Table 4). Educational differences in obesity were not statistically significant among young men, although 11 per cent of men with a basic level of education, 9 per cent with a secondary level education, 7 per cent with a higher vocational education, and 5 per cent with other higher education were obese. Among young women, on the other hand, the educational differences were statistically significant. The situation was particularly alarming for young women with no more than basic education, of whom 17 per cent were obese. The prevalence of obesity among women with a basic level of education was more than seven times higher than in the other higher education group.

Table 4. Prevalence of obesity (BMI ≥ 30) in population aged 18–29 (%) and number of participants (N) by educational group (Health 2000).

Education	Men		Women	
	N	%	N	%
Basic level	86	11.3	67	16.6
Secondary level	446	9.1	324	6.9
Vocational higher level	198	6.9	281	6.6
Other higher level	123	4.6	168	2.3
Total	853	8.1	840	6.6
p		0.233		0.003

According to Finnish Current Care Guidelines, normal blood pressure readings are 130 mmHg or less for systolic pressure and 85 mmHg or less for diastolic pressure. According to these guidelines blood pressure is elevated if the average of two measurements taken on four different days exceeds the limit of 140/90. In this study blood pressure was not measured on separate days, and therefore the higher limits were used. Blood pressure was considered elevated on the basis of a single measurement if systolic pressure was ≥160 mmHg or diastolic pressure ≥ 95 mmHg. Using these criteria, blood pressure was elevated in one-fifth of working-age men and more than one-third of older men (Table 5); among women the figures were 14 per cent and almost 40 per cent, respectively. In both men and women the prevalence of elevated blood pressure was higher among those with a lower education than those with more education in working age, but in the population aged 65 or over no such difference was observed.

Table 5. Age-adjusted prevalence (%) of elevated blood pressure (systolic blood pressure ≥ 160 mmHg or diastolic blood pressure ≥ 95 mmHg) by educational group (Health 2000).

Education	Men (%)			Women (%)		
	30–64 years	65 + years	30 + years	30–64 years	65 + years	30 + years
Basic level	24.8	36.4	27.0	15.2	39.3	21.3
Secondary level	21.0	31.8	22.8	14.4	39.1	20.1
Higher level	17.7	28.3	19.4	10.7	38.7	15.9
Total *	21.4	34.7	23.7	13.5	39.2	19.6
p	0.007	0.421	0.003	0.031	0.992	0.014

*Not adjusted for age

Table 6. Age-adjusted prevalence (%) of clearly elevated total cholesterol (≥ 6.5 mmol/l) and elevated LDL cholesterol (≥ 3.0 mmol/l) by educational group (Health 2000).

Education	Men			Women		
	30–64 years	65+ years	30+ years	30–64 years	65+ years	30+ years
Total cholesterol ≥ 6,5 mmol/l (%)						
Basic level	34.1	25.1	32.3	29.0	40.6	33.2
Secondary level	32.1	26.9	30.8	26.0	33.5	27.9
Higher level	26.8	27.4	26.2	23.9	33.5	25.2
Total *	31.3	25.6	30.3	26.3	38.7	29.5
p	0.006	0.880	0.017	0.062	0.134	< 0.001
LDL-cholesterol ≥ 3,0 mmol/l (%)						
Basic level	84.1	83.5	84.6	82.6	86.4	83.6
Secondary level	86.3	77.6	85.0	82.5	88.1	84.0
Higher level	83.9	84.7	83.6	76.7	85.1	77.9
Total *	85.0	82.5	84.5	80.0	86.5	81.6
p	0.296	0.324	0.695	0.001	0.762	< 0.001

* Not adjusted for age

According to Current Care Guidelines, the target level for total serum cholesterol is less than 5.0 mmol/l and for LDL cholesterol less than 3.0 mmol/l. On this criterion, 80 per cent of the Finnish population have elevated total cholesterol. In the Health 2000 survey, a total cholesterol level of 6.5 mmol/l or higher was regarded as clearly elevated: this cut-off level was chosen because virtually all people exceeding it would require intervention. Almost one-third of working-age men and one-quarter of elderly men had a total serum cholesterol level of 6.5 mmol/l or higher (Table 6). Among women, the corresponding proportions were just over one-quarter and almost 40 per cent. Among working-age men, the recommended limit was exceeded somewhat more often in the lower than in the higher educational category. Analysis of the prevalence rates revealed a similar educational difference among working-age women, too, but it was not statistically significant. In the population aged 65 or over, no educational differences were seen in either men or women. Among working-age men 85 per cent and among older men 83 per cent had elevated LDL cholesterol levels (3 mmol/l or over). For women, the corresponding proportions were 80 per cent and 87 per cent. No educational differences were found for either working-age or older men. Among working-age women, on the other hand, elevated LDL cholesterol seemed to be more common in those with less education than in those with more education. In older women no such difference was found.

Educational differences were found for several different risk factors in the population of working age, but less often in the population aged 65 or over. Part of the reason for the absence of differences in the population aged 65 or over may lie in selective mortality: people with the highest risk level have died before even reaching retirement age. It is also possible that birth cohorts used to be more homogeneous and that lifestyle interventions were not previously available that would have contributed to increasing the differences. Furthermore, in retirement age the differences related to pay, position and influence may gradually be ironed out. In the population of retirement age, the numbers of subjects in the various educational groups, particularly in the higher and secondary education groups, were fairly small, which in some instances may explain the absence of statistical significance.

Conclusions

Despite the differences in the samples and methods of the two recent population surveys reviewed here, we can draw some clear unequivocal conclusions about the differences in biological risk factors among Finnish people.

Obesity varies by social group especially among women, and it is clearly less common in women with a higher education. The difficulty here is that rather than decreasing, the socio-economic differences have tended to increase over the years, and are clearly evident even among younger adults. Among men, the socio-economic differences in the prevalence of obesity are not as pronounced as among women, but they are nevertheless quite clearly apparent especially in the working-age population.

Elevated blood pressure is more common in people with a low level of education, and the differences are most pronounced in the working-age population.

High total and LDL cholesterol is also more common in persons with a lower level of education. The differences are clearest in working age, and especially among men.

It seems then that all the key biological risk factors discussed above are more prevalent in people with less than more education. The depth and manifestation of these differences vary by sex and age group, but the general trend is clear and straightforward. The results are largely consistent with the differences reported in population surveys from other industrial countries (Bennet 1995, Manhem et al. 2000, Panagiotakos et al. 2005). Some researchers take the view that the first line of action in tackling the socio-economic differences observed in CHD morbidity must be to take steps to reduce the risk factors

(Emberson et al. 2004), hard though that might seem. Others maintain that preventive interventions aimed at the classical risk factors will not suffice, but that it is necessary to dig deeper to uncover the root causes of socio-economic differences in morbidity (Marmot 2004). It is likely that both these approaches are needed. First and foremost, we need to allocate resources to reducing the level of known risk factors and by the same token to reducing socio-economic differences in morbidity, but at the same time we will need open-mindedly to explore new and more diverse strategies whose influence is not mediated through known risk factors.

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4.3 Health care services

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One of the key cornerstones of Finnish health policy is equality between different population groups: a fundamental principle is to ensure that all people who live in the country have equal access to high-quality and adequate services irrespective of their socio-economic status, financial position, place of residence, or other factors that might constrain service use (Ministry of Social Affairs and Health 2001). This is also recognized in the Finnish Constitution, section 6 of which says that 'No one shall, without an acceptable reason, be treated differently from other persons on the ground of sex, age, origin, language, religion, conviction, opinion, health, disability or other reason that concerns his or her person' (The Constitution of Finland 1999). Furthermore, section 19 states that 'The public authorities shall guarantee for everyone […] adequate social, health and medical services'. The principle of need is spelled out in the Act on the Status and Rights of Patients, according to which patients have the right without discrimination to high quality health and medical care as required by their state of health (Act on the Status and Rights of Patients 1992).

The achievement of these goals is supported by several structural factors in the health care system. That system is regionally comprehensive and all people who live in Finland are entitled to use its services. The one exception to this rule, until 2002, was dental care in that only children and young people as well as certain specified groups were eligible to use public services. Health care services are mainly funded from the public purse, which spreads out the costs incurred. Although client fees were put up in the 1990s, increasing patients' out-of-pocket costs, many of those fees are comparatively low and indeed some services remain free of charge. Furthermore, expenses and loss of income due to illness are reimbursed from the national sickness insurance system. Reimbursements for dental care were progressively integrated into the sickness insurance system from the mid-1980s, and by the early 2000s they had been extended to apply to the whole population. In the 1970s and 1980s the problem of regional disparities in health care availability was tackled by means of centralised planning and the central government transfer system, and in the 1990s government funding was allocated on the basis of local governments' financial position and estimates of their need for services based on their current population structure.

Information on socio-economic differences in the use of health care services in Finland is scarce and fragmentary. Most of the data available are based on individual studies, and there are hardly any regular follow-up systems in place. Long-term follow-ups on health services and medication use and on socio-economic differences have only been conducted in the context of the population surveys by the Social Insurance Institution (SII) and the National Board of Health, and later by the National Research and Development Centre for Welfare and Health (STAKES). The first SII population interview was conducted in 1964, with follow-ups in 1968, 1976 and 1987. The latest population interview was carried out in 1995 and 1996. In addition, STAKES conducted a CATI telephone interview study on health services use in the adult population in 1991–1994. The first Welfare and Services survey, which also includes some items on the use of health services, was carried out in 2004. The Health 2000 Health Examination Survey also includes a battery of items on health services use. The picture painted of the use of health care services by these population surveys can further be complemented with data aggregated by linking census sources with National Care Register data on hospital services use in different socio-economic groups in the late 1980s and mid-1990s (Keskimäki 1997, Keskimäki 2003), and for 1992–2003 with the results of the ongoing REDD project (http://groups.stakes.fi/THP/FI/hankkeet/REDD.htm) (Manderbacka et al. 2008). Corresponding register-based sources have been used to study hospital admissions for a psychiatric diagnosis and how these have changed in 1991–1996 (Ostamo et al. 2005).

Part of the reason for the lack of information on socio-economic differences in health services use lies in the inherent methodological problems in this line of research. Health care is a diverse and complex field that involves both health promotion and disease prevention as well as outpatient care, hospital services, rehabilitation, various care services, and lots more. This in itself complicates the task of forming a complete and coherent picture of service use. What is more, much of the data available only concern service use: in the absence of information on the need for services, it is impossible to draw direct conclusions about the fair allocation of services. A specific problem with regard to data on mental health services is that some outpatient care services and many rehabilitation and housing-related support services are excluded from systematic data collection. For reasons of data protection and maintaining a low threshold to seek treatment, it is traditionally considered important that contacts with the primary health care system for mental health problems are not recorded as mental health visits. There are sound reasons for this, but it certainly makes it harder to gain an overview of the use of mental health services. Nevertheless it

is possible to draw some indirect conclusions from the data available that may be very helpful for the development of the service system.

Our aim in this section is to review the results of Finnish studies on socio-economic differences in the use and availability of health services primarily in the late 1980s and 1990s and in the early 2000s. A further concern is to assess how well the health care system has succeeded in securing equal opportunities for all social groups to use its services.

Outpatient health care services

The Finnish system of outpatient health care services is distinctive when compared to the systems of most other countries. It involves several different funding and service provision mechanisms that differ in terms of both user fees and service charges. The differences are also reflected in the patterns of outpatient service use between socio-economic groups. Most health centre visits are to see a general practitioner (GP), for which many local municipalities have charged a fee since 1993. Visits to a health centre GP as a proportion of all medical appointments have dropped back from 45 to 40 per cent in the 2000s (see Table 1). Most outpatient hospital visits are chargeable visits to specialists and usually require a referral from a health centre GP. In recent decades these visits have accounted for about one-fifth of all medical visits. Visits to private practitioners, in which the patient covers the largest share of the costs, consist in large part of visits to specialists. These visits have accounted for around 15–20 per cent of all medical appointments. In recent years the sharpest relative increase has been recorded for visits to occupational health physicians, which are free of charge to the patient. These services are available to people whose employers top up voluntarily obligatory preventive occupational health care with physicians' services.

Income-related inequity in health services use is often measured with a horizontal equity index, in which service use is expressed in proportion to service needs as assessed on the basis of morbidity and age and gender structure (Häkkinen 1991, van Doorslaer et al. 2004). The value of the index varies between –1 and +1. If the index is positive, the distribution of service use is pro-rich, i.e. favourable to people in the high income brackets; if it is negative, then the distribution is pro-poor, i.e. favourable to people with a low income. The positive value increases in proportion to high-income earners' service use relative to estimated need, while the negative value is the closer to value –1 the higher the level of service use by low-income earners. An index value of zero indicates equality in service use. Table 1 shows the horizontal equity indices for

all medical visits and separately for different sectors as calculated on the basis of the 1987 and 1996 Finnish Health Care Survey and the Health 2000 Health Examination Survey.[1]

Overall, in recent decades, medical visits in Finland have tended to lean slightly towards pro-rich inequity. In 2001, the index for all medical visits was 0.04. According to an OECD survey in 2000 comparing 21 OECD member countries, Finland had the highest horizontal inequity index for all medical visits (0.073), reaching the same level as in the United States and Portugal (van Doorslaer et al. 2004).

Sectoral inequity indices have shown very little change since 1987. Having said that, it seems that people in low-income brackets have increased the frequency of their medical visits slightly more than others in almost all sectors in the 2000s. This is reflected in their lowered index values, although the changes are not statistically significant. Outpatient hospital visits are more or less evenly distributed between different income brackets. Visits to a health centre GP show a pro-poor distribution, whereas the distribution of visits to a private practitioner and particularly to occupational health care services is pro-rich when the total population is taken into account. This sectoral differentiation seems to be a relatively constant structural source of inequity in service use in the Finnish health services system.

Dental care

Publicly funded oral health services, mainly provided through the network of local health centres, have been available in Finland for half a century now. Since 1986, programmes have been in place to subsidise the costs of private dental care for selected population groups, starting from the youngest age groups (0–25 years). In most parts of the country, up until 2000, only persons aged 0–44 were eligible to receive municipal dental care services. In December 2002, all age restrictions were lifted by amendment to the Primary Health Care Act: since then, people of all ages have been eligible to receive dental care in local health centres. At the same time, the sickness insurance reimbursements paid out for private dental care were extended to apply to the whole population. These changes are reflected in the structure of dental visits in that the share of health centre visits increased from 30 per cent in 1987 to 40 per cent in 2004, while the share of visits to private dentists dropped accordingly from 65 to 55

[1] The method is described e.g. in the OECD publication van Doorslaer et al. 2004. The equity index calculations in Table 1 have used age, sex, chronic morbidity and self-rated health to determine service need.

per cent (Table 2). Most of this change, though, happened in the first half of the 1990s.

The horizontal equity index can also be used to assess inequality in dental care.[2] Table 2 illustrates the development of the index in Finland since 1987, using the same sources as above in the case of medical services. Further data on dental service use are obtained from the 2004 Welfare and Services in Finland survey by STAKES. This allows us also to assess the impacts of the dental care reform in late 2002. The changes over time in dental care inequity have been very minor. Visits overall and private sector visits have shown a pro-rich distribution in recent decades, while the distribution of health centre visits has been pro-poor. The sharpest decrease in inequity in overall dental service use occurred by the mid-1990s, mainly as a result of the relative increase in the number of health centre visits by low-income earners.

It seems that the dental care reform in 2002 has had little effect in terms of reducing income-related inequity. Although the horizontal equity index for the total use of dental services in 2004 was lower than in 2000–2001 (0.071), the use of health centre services was more pro-poor than before, while the use of private dental services was more pro-rich. The OECD study (van Doorslaer et al. 2004) revealed income inequity in the total use of dental services in virtually all advanced countries in 2000, and the situation was much the same in Finland. As was observed in the case of outpatient service use, the sectoral differentiation of dental service use seems to be a relatively constant phenomenon in Finland.

Mental health services

Outpatient mental health services consist primarily of visits to primary health care doctors, psychiatric outpatient departments and mental health clinics, and various support services related to rehabilitation and day activities for chronically ill people. In addition, some rehabilitative and curative psychotherapy services have been available for people who are thought to benefit from those services. Psychotherapy services used to be offered in the public sector, too, but as the resources allocated to outpatient services have continued to dwindle, so their provision has increasingly become a private sector activity that is either supported by the Social Insurance Institution (SII) as discretionary rehabilitation or funded by dedicated appropriations or through health insurance. Hardly any research evidence is available on the socio-economic distribution of the use of private psychotherapy services, but patient selection is no doubt largely

[2] Need for dental care is assessed on the basis of age, sex and toothache.

Table 1. Need-adjusted number of medical visits[1] per capita aged 18 or over in different income brackets and service sectors and horizontal equity indices[2] for visits in 1987, 1996 and 2000–2001.

Income quintile	All			Health centres			Occupational health care			Hospital outpatient departments			Private sector		
	1987	1996	2000	1987	1996	2000	1987	1996	2000	1987	1996	2000	1987	1996	2000
I Lowest	1.11	1.33	2.55	0.66	0.76	1.47	0.05	0.08	0.14	0.20	0.29	0.49	0.15	0.13	0.29
II	1.30	1.56	2.92	0.71	0.81	1.28	0.12	0.10	0.48	0.22	0.41	0.56	0.21	0.19	0.48
III	1.30	1.64	2.98	0.63	0.82	1.28	0.16	0.15	0.47	0.24	0.34	0.61	0.24	0.24	0.52
IV	1.46	1.74	3.17	0.62	0.75	1.17	0.25	0.24	0.69	0.24	0.37	0.63	0.30	0.33	0.54
V Highest	1.60	1.86	3.22	0.49	0.65	0.94	0.31	0.31	0.82	0.28	0.40	0.50	0.46	0.47	0.78
Mean number of vistis	1.35	1.63	2.97	0.62	0.76	1.23	0.18	0.18	0.52	0.23	0.36	0.56	0.27	0.27	0.52
Index	0.07 ***	0.06 ***	0.04 ***	–0.06 ***	–0.03 *	–0.08 ***	0.30 ***	0.28 ***	0.25 ***	0.06 **	0.04	0.01	0.22 ***	0.25 ***	0.17 ***

* p < 0,05, ** p < 0,01, *** p < 0,001

[1] All = visits to an occupational health physician + visits to hospital outpatient departments + private sector visits + health centre visits and other visits. Because of the low number of other visits, the horizontal equity index was not calculated.

[2] Calculations of equity indices used age, sex, chronic morbidity and self-rated health as indicators of need.

Table 2. Need-adjusted number of dental visits[1] per capita aged 18 or over in different income brackets and service sectors and horizontal equity indices[2] for visits in 1987, 1996, 2000–2001 and 2004.

Income quitile	All				Health centres				Private sector			
	1987	1996	2000	2004	1987	1996	2000	2004	1987	1996	2000	2004
I Lowest	0.35	0.56	1.10	1.29	0.18	0.29	0.59	0.72	0.15	0.23	0.45	0.48
II	0.40	0.66	1.24	1.14	0.15	0.29	0.50	0.63	0.24	0.31	0.69	0.48
III	0.52	0.67	1.38	1.31	0.18	0.29	0.54	0.53	0.32	0.35	0.77	0.75
IV	0.55	0.71	1.35	1.47	0.15	0.24	0.47	0.46	0.38	0.45	0.82	0.97
V Highest	0.67	0.86	1.60	1.54	0.09	0.19	0.36	0.40	0.54	0.64	1.19	1.10
Mean number of visits	0.50	0.69	1.33	1.35	0.15	0.26	0.49	0.55	0.33	0.39	0.78	0.76
Index	0.14***	0.08***	0.07***	0.05***	−0.09***	−0.09***	−0.08***	−0.12***	0.25***	0.20***	0.18***	0.19***

* p < 0.05. ** p < 0.01. *** p < 0.001

[1] All = private sector visits + health centre visits and other visits. Because of the low number of other visits. the horizontal equity index was not calculated.

[2] Need for dental care determined on the basis of age, sex and toothache.

determined by the same factors that are associated with success at work and in social life. One of the SII criteria for granting rehabilitation benefit for psychotherapy is that it helps to maintain and restore work ability, so on this basis it is probably quite rare that people who have been excluded from work ever get the chance to receive rehabilitative psychotherapy. Furthermore, it needs to be borne in mind that long-term psychiatric morbidity, through the loss of work ability, social skills and other factors, is a significant determinant of social decline and exclusion, and that mental disorders often have an early age at onset, which may influence the individual's eventual social status position.

A recent study using the materials collected for the Health 2000 project found that the selection of patients with depressive disorders into different types of treatment was mainly dependent on the subjective harm caused by their condition and the severity of their depressive state. Socio-demographic factors, including education and occupation, seemed to have little bearing (Hämäläinen et al. 2008).

Hospital services

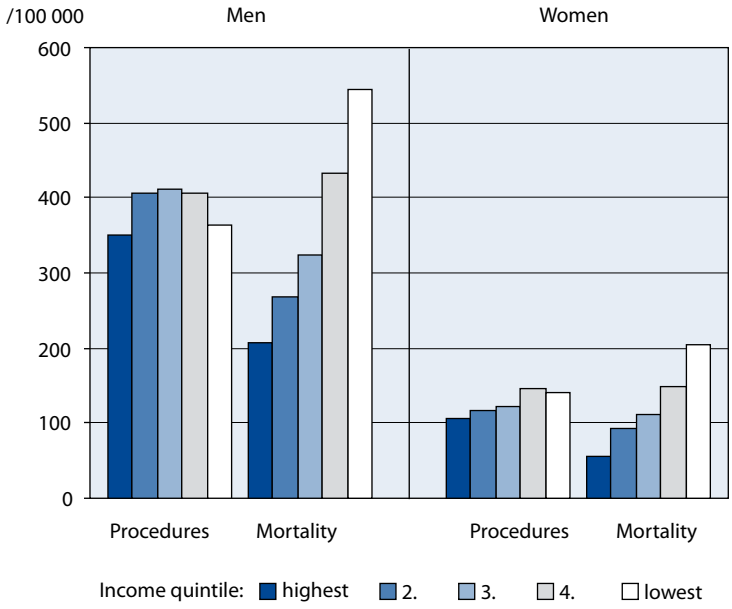
Socio-economic differences in general hospital treatment have varied in much the same way as morbidity. At least in the late 1980s and mid-1990s, low-income earners used more hospital services than people with a high income. However, at both these time points there were differences in the content of care that do not seem to be associated with the need for services. In lower income brackets, the relative number of hospital admissions that involved no surgical procedures was higher than in higher income brackets. More surgical procedures were performed in higher income groups (Keskimäki 2003). Based on morbidity data there is no reason to assume that these differences in surgical procedures correspond to the income-related differences in the need for services.

In some disease categories, the research evidence points to rather clear differences. Several Finnish studies have reported differences in the treatment of CHD. According to results from the FINMONICA study at the turn of the 1980s and 1990s, higher socio-economic status men having their first myocardial infarction received thrombolysis more often than others in the acute stage of the illness. Upon discharge from hospital, men in the highest income tertile were prescribed medication to prevent recurrence more often than low-income earners. Furthermore, within one year of first myocardial infarction, coronary artery bypass grafting or angioplasty was performed more often in men with a higher income than in men in other groups (Salomaa et al. 2001).

Socio-economic differences in hospital service use and in the quality of care narrowed somewhat in the 1990s as coronary artery procedures became more widespread (Hetemaa et al. 2003), but they were still not strictly determined according to need. In 1996, for example, similar differences were still observed in coronary artery procedures among patients having their first myocardial infarction (Hetemaa et al. 2004). In the late 1990s, the results were largely the same for CHD that had started with symptoms of angina pectoris (Hetemaa et al. 2006). Figure 1 shows that the socio-economic differences in these procedures have continued to narrow up to 2003. As well as showing the number of procedures performed, the figure illustrates the level of CHD mortality to describe the differences in needs. These were still very pronounced in 2003 and cut across the entire income hierarchy. Among men with CHD, differences by social group were still seen in 2002 in the use of statin treatment, which is recommended for the prevention of new cardiac events (Keskimäki et al. 2004). Among women, there was no corresponding difference in the use of statins. No significant differences were seen in either men or women in the use of antithrombotic medication or beta-blockers.

Elective surgical procedures involve much deliberation within the health care system as to the necessity and timing of the procedure. Therefore they present a particularly interesting case for assessing the operation of the system. Table 3 provides an overview of socio-economic differences in selected surgical procedures in 1992, 1996 and 2003 using concentration indices (Manderbacka et al. 2008). These indices are interpreted in the same way as equity indices, but they are not adjusted for need, only for age. The number of procedures performed increased most particularly in the cases of coronary artery procedures and endoprosthetic surgery of the knee and hip. By contrast the number of hysterectomies remained almost unchanged. Among men, almost all procedures showed a pro-rich distribution in the early 1990s. Inequity increased or remained at the same level for all procedures up to 1996, but in 2003 the distribution of surgical procedures became pro-poor in endoprosthetic surgery, coronary artery procedures, and lumbar hernia operations. Among women, the differences developed in a similar direction, but in 2003 the only pro-rich operations were hysterectomies and lumbar disc operations. It seems then that the increase in the number of surgical procedures in the early 1990s favoured the higher income brackets, but in the late 1990s and early 2000s this same trend has levelled out socio-economic differences at least in the use of some surgical services. However, it is necessary to bear in mind that not all diseases leading to a need for surgical intervention are evenly distributed in the population, as was discussed earlier in the case of CHD. For instance, the Health 2000

Figure 1. Coronary artery procedures (angioplasty or bypass grafting) and CHD mortality by income and gender in the Finnish population aged 25–84 per 100,000 population in 2003.



Source: National Care Register (HILMO), unpublished data

survey found that the prevalence of myocardial infarction and back syndrome in men and that of osteoarthritis of the knee in women was higher in lower socio-economic groups. The results pointed in the same direction for the prevalence of myocardial infarction and back syndrome in women, osteoarthritis of the knee in men, and osteoarthritis of the hip in both men and women (Aromaa and Koskinen 2004).

Similar results have been reported for the prevalence of cataract surgery in the mid-1990s, for instance: the number of men who had this operation in the highest income quintile was 50 per cent higher than in the lowest income quintile (Keskimäki 2003). The corresponding difference among women was 43 per cent. The results for the surgical treatment of children repeat much the same pattern. During one year, the number of children from families in the lowest income quintile receiving tympanostomy tubes was almost one-third lower than in children from families in the highest income quintile.

Table 3. Changes in income-group differences in certain elective surgical procedures in the Finnish population aged 25 or over. Concentration indices (CI) and their changes calculated on the basis of income quintiles, using the total Finnish population of the same age as risk population.

	Women					Men				
	1992	1996	2003	Change		1992	1996	2003	Change	
	CI	CI	CI	1992–96	1996–03	CI	CI	CI	1992–96	1996–03
Endoprosthesis of the hip	–0.033	0.005	–0.044	0.039	–0.050	0.003	0.011	–0.010	0.008	–0.021
Endoprosthesis of the knee	–0.028	–0.025	–0.048	0.003	–0.023	–0.044	0.022	0.024	0.066	0.002
CHD procedure	0.038	0.020	–0.068	–0.018	–0.088	0.076	0.076	–0.010	0.000	–0.086
Lumbar hernia operation	0.072	0.058	0.046	–0.014	–0.012	0.052	0.077	0.065	0.025	–0.012
Hysterectomy	0.060	0.061	0.053	0.001	–0.008					
Prostatectomy						0.001	–0.003	0.032	–0.004	0.035

Source: Manderbacka et al. 2008

Marked educational differences have also been found in the use of psychiatric hospital services. Psychiatric hospital admissions were several times more common among people with the least education as compared to those with the highest education. This might reflect the significant influence of more severe psychiatric illness on educational and occupational achievement. Depending on the type of disorder and the year, the differences have been between 2 and 10-fold. The differences between educational groups increased from the early 1990s through to 1996. At the same time, however, if treatment periods due to substance-related disorders are excluded, the length of treatment periods changed in the opposite direction. People with the least education spent less time in treatment, while the treatment periods for people with a higher education lengthened or remained unchanged. Furthermore, the relative number of people with the least education who received specialist psychiatric care decreased in the early 1990s (Ostamo et al. 2005). This may partly be a reflection of the growing diversity of hospital treatments and the overall increase in short-stay treatments in hospital.

Quality of care and outcomes

It is difficult to assess how patient prognosis is impacted by the quality of care, and there has been very little research in Finland to explore socio-economic differences in treatment outcomes. However, the differences described above in the quality of care for myocardial infarction patients go some way towards explaining why in the early 1990s, almost half of low-income males died within one year of infarction, while the corresponding proportion in the high income bracket was just over one-quarter (Salomaa et al. 2001).

There are also other mortality studies which suggest that there are differences in the quality of care: these include studies on causes of death preventable by health care interventions (Poikolainen and Eskola 1995) and on mortality among cancer patients (Auvinen and Karjalainen 1995). Both of these studies reported the highest mortality in the lowest social groups, but these data concern the 1980s, since which time there have been significant changes in health care.

In the 1980s, there were no clear socio-economic differences in the mortality of diabetics (Koskinen et al. 1996), but these differences widened in the 1990s as mortality among blue-collar diabetics decreased much less sharply than it did among white-collar diabetics, or mortality in the total population (Forssas et al. 2003). One possible explanation offered for these differences is that patients in higher social status positions benefited more from the improvements in diabetes care introduced in the late 1980s and early 1990s.

There remains a scarcity of research on the treatment of mental disorders, but in the light of current knowledge some people who are in need of care receive no or incomplete treatment. The inadequacy of treatment is partly revealed by the evidence that depression remains the leading cause of premature work disability (Finnish Centre for Pensions and Social Insurance Institution 2006) and by the excess mortality of psychiatric patients (Joukamaa et al. 2001). Following the dramatic reforms introduced in psychiatric services over the last two decades, patients with increasingly severe mental disorders have been discharged to outpatient care. However, because of a long-standing shortage of psychiatrists and other reasons, psychiatric outpatient care has not worked in the best possible way. Severe mental disorders in particular are associated with low social status, low education, unemployment and living alone (Ostamo et al. 3.4 in this report). If access to mental health services is difficult in general, it is particularly so for special needs groups as well as for socially and economically deprived groups.

Future challenges

The changes that have taken place in health care in the past decade have been contradictory from the point of view of socio-economic equality. In the use of outpatient services, the socio-economic differences have remained more or less unchanged. Improvements in service efficiency have had the effect of reducing these differences, for instance in the case of certain surgical procedures in hospital. On the other hand, cutbacks in health care resources prompted by the 1990s recession meant that it was harder especially for socially and economically deprived groups to get the treatment they needed, at least for certain illnesses.

The increase in fees charged to health care clients increased the cost burden of service users particularly in lower social groups, where morbidity is higher than average. As a result of these increases, the proportion of total health care costs covered by high-income groups decreased as compared to low-income groups. (Kapiainen and Klavus 2007.)

Psychiatric services were more severely affected by funding cuts in the early 1990s than other health care sectors, forcing dramatic cutbacks in these services. Inevitably, low social status groups suffered more than others: in these groups mental problems are more common than in others, and they are unable to resort to private mental health services to the same extent as others.

As regards hospital care, there still remain certain features that sustain inequality among patients, especially so in surgical care. In certain procedures,

such as cataract surgery in the 1990s, the differences are probably explained in part by the use of private hospital services (Keskimäki 2003). Other factors that may contribute to explaining the differences in surgical hospital care include the structure of outpatient services and the socio-economic differences in the use of these services. In Finland, private practitioners play a major part in referring patients to hospital care. In 1996, for example, one-fifth of all patients in municipal hospitals had a referral from a private practitioner. For some elective surgical procedures, the proportion of referrals from private practitioners was considerably higher. At the beginning of the 2000s, the situation remained unchanged at least for certain elective surgical procedures. According to National Care Register data, 80 per cent of cataract surgery patients in 2003 had a referral from a private practitioner; among hysterectomy patients the figure was about 50 per cent; among knee or hip joint surgery patients about one-third; while for coronary artery procedures it was only about 7 per cent. Indeed it seems that socio-economic differences in the use of outpatient services are reflected in the use of specialist services.

Socio-economic differences in mortality and self-rated health, for example, have been greater in Finland than in many other affluent industrial countries (Valkonen et al. 3.1 and Rahkonen et al. 3.2 in this report). Other indicators, too, suggest that socio-economic differences here are at least as pronounced as in other countries (Koskinen et al. 3.3 in this report). Health inequalities do not flow directly from differences in health care, but a whole range of factors that have to do with the general conditions for well-being are involved, such as socio-economic differences in working conditions, the social environment and lifestyles. Health care, however, may act to maintain or even increase health inequalities if the socially most deprived persons and those in the worst health are unable to access and use the health services they need to the same extent as others. On the other hand, some socio-economic health inequalities have been successfully reduced by means of health care. In Finland, good examples are provided by the impact of child welfare clinics on regional and socio-economic differences in child mortality and children's health (Kannisto 1988), as well as the impact of screening programmes on differences in cervical cancer morbidity (Hakama et al. 1995).

There are many ways in which health care can effectively intervene to influence patients' prognosis, functional capacity and health-related quality of life. Indeed one major challenge is to ensure that the whole population, including the socially and economically most deprived groups, have access to services, and to ensure that they have equal opportunities to benefit from the health services they need. In this way health care could significantly contribute to

achieving the objective of reducing socio-economic health inequalities as set out in the national Health 2015 programme.

The growth of multiculturalism in Finland is also throwing up new challenges for service provision. The proportion of people born in a foreign country and other ethnic groups is still exceptionally low in Finland, but with the escalation of immigration it is clear that ethnic differences will shape and influence existing socio-economic differences if the people who are moving in take up low-paid jobs more often than others. Health care should make sure that ethnic differences are not allowed to increase inequality in the availability of health care services.

From a health equality point of view, there are several challenges that health care must proactively address. Perhaps most importantly, it must pay closer attention to the needs of the socially most deprived groups in the planning and organisation of health services as well as in everyday care practices. There are certain structural characteristics in the health care system that seem to be associated with socio-economic differences in service use. These include the production of outpatient services in three separate systems, the relatively high funding burden on households, and shortfalls in the supply of specialist services in relation to demand in the public sector. Therefore, apart from efforts to improve service provision, steps are needed to develop the structures of health care.

It is necessary to improve the supply of services most particularly in psychiatry, but also in other specialist outpatient services and in dental care with a view to facilitating the access of the socially and economically most deprived groups. In mental health care, special effort must be invested in reaching patients with multiple problems (mental health problems, substance abuse problems, social problems, etc.), in developing the special skills and competencies required by competent care, and in stepping up collaboration between social and health care services. The prevention and early detection of mental health problems and lowering the threshold to treatment will require proactivity on the part of other service providers as well, such as student welfare in schools and child protection and family counselling centres in the police and social welfare sectors. Universal primary health care plays an absolutely pivotal role in securing comprehensive and high-quality care. In outpatient care, it would be important to develop public services and to promote intersectoral integration. In hospital service use, better coordination is needed for more effective referral of patients to specialist care. Finally, in assessing the appropriate level for client fees, it is important to bear in mind the objectives of health policy and to make sure that even those people who are in a financially precarious situation have access to the services they need.

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5 REDUCING SOCIO-ECONOMIC HEALTH INEQUALITIES IN FINLAND: PROBLEMS AND OPPORTUNITIES

Marita Sihto, Hannele Palosuo and Eila Linnanmäki

The statistical and research sources available in Finland provide a rather clear picture of the extent and recent trends in socio-economic health inequalities. Most of the research on health inequalities has focused on how health is impacted by socio-economic position and its component factors (occupational status, educational level and income), whereas less attention has been given to factors impacting people's socio-economic position and to how these factors translate into health inequalities (Graham 2002). What we mean by this is that the chains and mechanisms of causation that lie behind health inequalities are still not well understood, especially as far as social factors are concerned. Even though there is a relative abundance of research on the extent of health inequalities both in Finland and elsewhere, there is a paucity of knowledge about the underlying causes and how to tackle them, which implies that only very little guidance can be offered for informed decision-making in social and health policy.

Social and health policy research, too, has paid only scant attention to health inequalities in Finland, when compared to the situation in the UK, for instance. Very few evaluations have been conducted to assess the impacts of social interventions and policies on health and health inequalities, or the impacts of the numerous health policy projects completed over the years. These shortfalls in policy research and the limited knowledge available about the exact mechanisms behind health inequalities and about how to intervene in those mechanisms, may be one reason why there has been so little discussion and debate in Finland about strategies of reducing health inequalities – and perhaps to some extent why the efforts so far have had limited success.

Putting scientific knowledge to use is just one part of the policy process, however. That knowledge is needed so that realistic and credible targets can be set for the reduction of health inequalities. This alone is not enough, but those targets must also be politically acceptable and the measures proposed must be viable and enforceable (Nutbeam 2003, 156). These latter requirements have proved a particularly difficult hurdle, not just in Finland but elsewhere.

At the most fundamental level, the narrowing of health inequalities requires a social policy that addresses social inequality in general. It is generally acknowledged that welfare state measures aimed at reducing inequality in soci-

ety also contribute to reducing social inequalities that are manifested in health inequalities (e.g. Dahl et al. 2006, 193). In principle, public health and health disparities can be influenced directly by measures taken by the health sector or indirectly by measures taken by various other administrative branches. However, in the search for measures and tools to reduce health inequalities, it has to be borne in mind that political and economic decisions with health implications are no longer taken only at the national, regional and municipal level, but increasingly at the EU and global level as well.

Our purpose below is to discuss the thinking that lies behind the key documents of Finnish health policy and to review the approaches and goals set out in those documents for the reduction of health inequalities. We also touch upon the significance of broader social policy measures in reducing health inequalities, referring to experiences from other countries. Furthermore, we consider the problems as well as the opportunities in reducing health inequalities.

NATIONAL HEALTH POLICY GOALS FOR THE REDUCTION OF HEALTH INEQUALITIES

Health policy programmes

An equal distribution of health in the population was first adopted as a health policy objective in Finland in the 1960s and 1970s (e.g. Economic Council 1972). The goal of reducing health inequalities is now incorporated in all major health policy programmes. The goals set out in the 1986 Finnish *Health for All by 2000* (HFA 2000) programme were based on data concerning mortality differences between population groups. In the 1980s, Finland was among the first European countries to adopt the task of reducing socio-economic health inequalities as an explicit health policy objective.

In public health programmes, the main focus in narrowing health inequalities has been on two areas, i.e. health care services and the promotion of healthy lifestyles and health (MSAH 1987, MSAH 1993, MSAH 2001a). This focus has remained essentially unchanged for the past two decades.

In the HFA 2000 programme (MSAH 1987), these focuses were concretised in two lines of action, which concerned precisely the areas of health care and the promotion of healthy lifestyles. The revised programme of cooperation (MSAH 1993) specified 12 lines of action aimed at reducing health disparities.

In the most recent public health programme under the heading of *Health 2015* (MSAH 2001a), the reduction of health inequalities between population groups is singled out as a key objective. In implementing the programme, a major aim will be "to reduce inequality and increase the welfare and relative status of those population groups in the weakest position". Furthermore, the programme sets the specific target of reducing mortality differences between men and women, between groups with different educational backgrounds, and between different vocational groups by one-fifth. In other words the 2015 programme is specifically focused on deprived groups and on reducing health disparities between population groups. The wordings give to understand that efforts to increase well-being in the population should also have the effect of reducing social inequality. The ultimate goal is to achieve better equality in health.

Among the 36 lines of action in the Health 2015 programme, two make explicit reference to the goal of health equality (MSAH 2001a, 28). According to action line 16, "*health care must be developed in a way that will guarantee everyone equal, sufficient and high-quality services, so that regional and socioeconomic status does not limit access to the necessary services*". Action line 17 goes on to say that social welfare and health care services must be developed "*so as to ensure that everyone, regardless of socioeconomic status or origin, is able to get understandable information about [...] health and its promotion, together with the chance to influence decision-making concerning their own health*."

Closely related to these lines of action is the national project launched in 2001 to safeguard the future of health care services (MSAH 2001b). One of the project's tasks was to specify statutory maximum waiting periods for admission to care. Socio-economic health inequalities were also identified as a key challenge in the development of the health service system. However, the proposed measures made no reference to any direct action aimed at narrowing health inequalities other than the discontinuation of the hospital special payment category, which allowed patients to choose their doctor against extra payment (MSAH 2002a, 18). This payment category has been phased out in March 2008. However, the project has failed to address other key aspects of the health service system, such as differences in treatment outcomes and in the quality of care (see Keskimäki et al. 2002, Teperi 2004, Manderbacka et al. in this report). Furthermore, the goals of health promotion and disease prevention, as highlighted in action line 17 (and partly in action line 18) of Health 2015, were overshadowed in the health care project proposals by the development of hospital services (MSAH 2002b, cf. Rimpelä 2004, 127).

The reduction of health inequalities in Government Programmes

Health inequalities between population groups have also received mention in the last two Government Programmes. The programme of Prime Minister Vanhanen's first Cabinet declared that "*a concerted effort will be made to narrow any health-related inequalities among the different population groups through resolute health and social policy action and by foregrounding health and social welfare concerns in public decision-making and practical measures.*" (Prime Minister's Office 2003, 15). On this basis it is fair to say that this programme (which was effective from 2003 to 2007) took a more comprehensive approach to health inequalities than earlier Finnish health policy programmes, for it recognized that those inequalities cannot be reduced solely by developing the service system. Indeed, the stance adopted in the Government Programme can be considered to come close to the broad approach of healthy public policy (cf. Sihto et al. 2006), and it incorporated the key idea of health policy programmes to pursue not only a high level but also an equal distribution of health (see also WHO 1998). Health inequalities were approached from a strategic perspective by referring to the role of social and health policy and to the significance of public decision-making to health and health inequalities. A strategy document adopted towards the end of the term of Prime Minister Vanhanen's first Cabinet defined health inequalities as a *social problem*, pointing out that a successful campaign to reduce those inequalities will require a dedicated strategy and action plan (Prime Minister's Office 2006, 81). Indeed an action plan was prepared by the Committee for Public Health under the auspices of the Ministry of Social Affairs and Health between autumn 2006 and spring 2008 and was published in the summer of 2008 (MSAH 2008).

The programme of Prime Minister Vanhanen's second Cabinet states that contented people enjoying good health provide the basis for Finland's economic success and competitiveness. Health inequalities are still recognized as a problem. According to the Government Programme, "*the goal of social and health policy is to promote health, functional capacity and initiative, and diminish the differences in the state of health between the individual segments of population*". The programme requires that steps must be taken "*to ensure an adequate level of income security and maintain the work ability of the people and to guarantee the availability of well-functioning primary services to all citizens irrespective of place of residence and wealth*" (Prime Minister's Office 2007).

The programme of Prime Minister Vanhanen's second Cabinet also includes a policy programme for health promotion, the goals of which are "*to improve the general state of health of the population and to narrow the health gaps between individuals.*"

STARTING-POINTS FOR MEASURES TO REDUCE HEALTH INEQUALITIES

One of the key challenges in reducing health inequalities comes from the fact that those inequalities are created and upheld by so many different factors at different levels at the same time. The very complexity and diversity of the causal chains makes it much harder to find well-targeted structural measures to reduce health inequalities than to identify measures to reduce, say, poverty. Health cannot be 'redistributed' in the same way as income (Fritzell et al. 2005, 181), where distributions can be adjusted by means of various social income transfers. As Dahl and colleagues (2006, 215) point out, if it proves difficult to influence the distribution of health directly, there is still the option of trying to influence it indirectly, through the determinants of health inequalities.

The factors that generate health inequalities are related to social structures (e.g. the education system and regulation of income distribution), working and housing conditions, lifestyles and psychosocial factors (see e.g. Lahelma et al. in this report). Indeed, as Munro (2006, 187) observes, health inequalities should not be seen primarily as a *health problem*, but as a *problem of inequality*. It is, according to Munro, social inequality, i.e. inequality of access to power and resources – which results in health inequality as well as other inequalities including inequality in education, housing, employment, nutrition and so on. Graham and Kelly (2004, 5) also draw attention to the unequal distribution of the *determinants* of health as underlying causes of health inequalities.

One way to try and iron out health inequalities between population groups is by means of social and health policy and other 'upstream' measures (e.g. Whitehead et al. 2001, Mackenbach et al. 2002, Stronks 2002, Diderichsen et al. 2001). Most of the recommendations put forward in the 1980 Black Report, the British Government commissioned document that triggered the whole international discussion on health inequalities, concerned measures outside the health care field (Townsend & Davidson 1982). Dahlgren and Whitehead (1992) have also emphasised the importance of interventions in social and material factors, such as working and living conditions. Another expert report commissioned by the British Government, which was to have a profound influence on British health policy (Acheson 1998), offered 39 recommendations covering a large part of structural factors that impact health inequalities. One of the report's major conclusions was that individual interventions directly aimed at health can have little effect in terms of narrowing health inequalities, unless resources are increasingly allocated to deprived groups. Most of the report's

recommendations are other than suggestions designed to resolve immediate health problems. Indeed the Acheson Report's health policy approach that addresses structural inequality has been described as a socio-economic model (Sassi 2005, 76).

Among other contributors to the recent international debate on health promotion and health inequalities reduction, the WHO Commission on Social Determinants of Health has pointed out that it is necessary to alleviate social stratification more generally, for instance with respect to income distribution, education and in the world of work (WHO 2005). Furthermore, it has been suggested that other social determinants of health should also be taken into account, such as living conditions and the operation of the service system (WHO 2005, CSDH 2008).

The approaches outlined above provide conceptual *starting-points* for the planning of measures to reduce health inequalities. The problem is that we have hardly any research evidence on which policies would actually work and help to reduce health inequalities (e.g. Lewis et al. 2006, Mackenbach et al. 2002). It remains a matter of debate to what extent interventions should incorporate downstream factors that directly impact health, and to what extent they should be based on upstream factors that address structural factors. It has been pointed out that rather than just dealing with the immediate manifestations of health inequalities or immediate risk factors (e.g. behaviours with adverse health effects and risk and exposure levels), we must also consider the underlying causes of health inequalities (e.g. working conditions, unemployment and poverty) and factors that generate social inequalities. However there is probably fairly broad consensus by now that in order to effectively reduce health inequalities, we will need both these approaches.

Universalistic health policy and the problem of health distribution

Finland's official policy goal has long been to improve the health of the whole population, in keeping with the principles of universalism. The recent trends of growing inequality, however, raise the question as to whether this universalistic social policy has adequately addressed the needs of different population groups.

Indeed, one of the criticisms levelled against universalism has been that its inherent premise of similitude fails to take account of existing inequalities (e.g. Williams 1992). Graham (2004a, 110) points out that in some population groups, social policy decisions aimed at promoting the population's general health may have the exact opposite effect. She concludes that general measures

have failed to sever the connection between social deprivation and premature mortality. This comment warrants serious consideration especially in the Nordic countries and Finland. As these countries have had good success in raising the population's average level of health by measures aimed at reducing social inequality and at improving health and well-being (e.g. Navarro et al. 2001), the thinking tends to be that these same measures should have had equally beneficial effects on the distribution of health. However, this has not been the case, nor are health inequalities in the Nordic social democracies any less marked than in conservative and liberal countries (Dahl et al. 2006, 203–210). In Finland, absolute and relative mortality differences are fairly high in comparison with Norway, Denmark and Sweden (Dahl et al. 2006, 212). Even though Finnish health policy has been specifically aimed at both equal opportunities and at equal outcomes, not all population groups have benefited from the favourable health trends to the same extent.

In other words, the pursuit of a high level of health may actually work against the goal of an equal distribution of health (e.g. Crombie et al. 2005, 44). This can happen if resources are allocated primarily to areas that are expected to yield the quickest and easiest results in lowering mortality and morbidity levels. On the other hand, if resources are allocated only to the socially most disadvantaged groups, then the overall outcome will probably be less favourable than if the whole population is targeted (Crombie et al. 2005). The tension between the *level* and *distribution* approaches may also be seen in the application of the same measures to achieve a high level and an equal distribution. At least some differentiation is necessary, however, because it is unlikely that the same methods will prove effective in groups with different levels of health. Often the problem is that tried and tested means for health inequalities reduction simply are not available. Sometimes a public health problem cannot be tackled because the necessary means are not politically feasible. One example is provided by Finnish alcohol policy, where decision-making has largely been ceded to the level of the European Union. In this situation the national and local health policy tools available are largely confined to traditional health education focused on living habits,[1] which is still to prove its effectiveness in reducing health inequalities (Gepkens et al. 1996).

Graham (2004a, 113) has pointed out that there is an inherent inequality between population groups, both with respect to social status and health. Low

[1] Even though many living habits are important to the development of health inequalities, health behaviours can only explain part of the differences in health variation (Marmot et al. 1991, Lantz et al. 1998). Therefore health education can have only limited effectiveness in reducing health inequalities.

social position tends to lead to health deprivation. People in a higher social position, on the other hand, have by definition more resources and by the same token the best chances to avoid risks, illnesses and their consequences and to maintain their health. It is this distribution of social resources that needs to be reallocated in order that health inequalities can be reduced. (Graham 2004a, 111–112; cited in Link et al. 1995).

It is obvious then that in addition to universal measures, there is also need for more targeted interventions to improve the situation of the groups in the poorest health. One of the social policy approaches to address the situation of the most deprived groups is a model of positive discrimination, in which measures aimed at the total population are complemented by targeted measures or benefits (Titmuss 1976). These measures must not stigmatise, but more adequately meet the recipients' needs and in the present case bring the groups in the most disadvantaged position closer to the groups who are in the best health.

The health gap and health gradient

In weighing the different strategy options to reducing health inequalities, one possibility is to focus on the differences between the people in the best and the worst situation. This will often reveal a relatively wide health gap. On the other hand, many indicators of health and related risk factors show a steady, incremental change, with higher social resources and social status correlating with better than average health (and accordingly lower health-related risks). This is often referred to as the health gradient (see also Lahelma et al. in this report).

Health policy must usually take account of both these perspectives. It is a constitutional requirement in Finland to ensure and protect the health of all citizens, but the greatest benefits to public health will probably be achieved by raising the health standards of large sections of the population who are in relatively poor health and by bringing them closer to those who are in the best health. Many public health problems tend to cluster in the socially most deprived groups. For instance, no more than some 10 per cent of all diabetics aged 30 or over have a higher education, and more than half of them have a basic education or less (Koskinen et al. 2005). Similarly, mobility difficulties are more common in lower than higher educational groups (Sainio et al. 2007, Martelin et al. in this report).

Improving the health of disadvantaged groups is closely akin to the fight against social marginalisation. In the UK, documents on health inequalities (e.g. Secretary of State for Health 1999, Benzeval 2002) have emphasised

the associations between marginalisation and poor health. In Finland, too, it would be useful and important to bring this issue into public debate and to take more active steps to improve the conditions for health in disadvantaged groups. These measures may either be related directly to actions in the health sector (e.g. health care for prison inmates), or the health sector may have direct influence over those measures (e.g. health care for the homeless). It is also important to consider these measures in the context of the national action plan against marginalisation (see MSAH 2003). Since they are related to the health sector, they may well have high political feasibility.

The role of the health sector and other sectors in reducing health inequalities

Health inequalities can be addressed and tackled not only in the health sector, but other social policy fields as well. It makes sense for the health care sector to set about the task of reducing health inequalities by concentrating first on its home base; this way any measures and recommendations proposed to other sectors and agents will carry greater legitimacy and credibility. The efforts invested by the health sector have indeed yielded some good results in health disparities reduction in Finland. For instance, ever since the 1960s there has been a determined effort to spread the costs of illness, to expand the regional availability of health services and to improve the population's health habits. Regional differences in the use of health services have decreased, regional differences in infant and child mortality have disappeared (Kannisto 1988, Koskinen and Martelin 1994, Koskinen and Martelin 1998) and the East-West differences in health behaviours are much less pronounced than before (Vartiainen et al. 1998, Vartiainen et al. 2003).

However, much more could still be done in health administration and in the health care sector in general. For example, action plans for health promotion have rarely included measures supporting the health distribution objective (Prättälä et al. 1999). Similarly, health promotion programmes concerned with health-related behaviours have rarely raised the issue of socio-economic health inequalities or proposed any specific measures aimed at reducing those disparities (Linnanmäki 2006). In general there has been only little discussion and debate in Finland on the role of health care in health promotion, or on reducing health inequalities as part of health promotion (cf. MSAH 2002c). Internationally, however, the role of health promotion in reducing health inequalities has received increasing attention (e.g. Catford 2002). In Sweden, for instance, major emphasis is placed on the responsibilities of health care in health promotion

and in reducing health inequalities (National Institute of Public Health 2007). The same emphasis is present in the health promotion report concerning the development of the National Health Service in England and Wales (NHS Wales GIG Cymru 2005).

By virtue of its health expertise, health care has a special advocacy role (McKee 2002) to intervene in health disparities both within its own area and in other administrative sectors. There are two sides to this role: on the one hand, in keeping with its basic mission, health care should ensure the health of the whole population and promote the health and provide care for the illnesses of the most disadvantaged groups; on the other hand, health care can influence public decision-making by communicating its expert views and opinions on the specific needs of different population groups, on which it has first-hand experience.

In a report by the Public Health Agency of Canada (Her Majesty the Queen… 2005), the health system is similarly described as a key factor of population health. If health care and public health programmes do not include a focus on the needs of disadvantaged individuals, populations and communities, then there is a risk that health inequalities will increase rather than decrease. The health sector can mitigate the effects of other determinants of health through interventions focused on the most disadvantaged groups in society (Her Majesty the Queen… 2005, 7–8).

According to the Public Health Agency's report, the role of the health sector has been viewed from two different directions: the reduction of health inequalities should be a health sector priority, and at the same time the goal of reducing these inequalities should be integrated into public health programmes and services (Her Majesty the Queen… 2005, 7–8). Among the actions proposed are the following:

- the health sector should set quantitative *targets* for the reduction of health inequalities, monitor trends and produce periodic reports on progress;
- an *integrated strategy* should be developed to reduce health inequalities (the health inequalities perspective should be incorporated in the planning, execution and evaluation of all public health programmes)
- the *impact* of current and potential health sector policies on health inequalities should be assessed to guide policy and programme decisions.

These recommendations have current relevance in Finland, too. In principle these proposals are not new, but there has been very little action to put them into practice. Manderbacka et al. (section 4.3 in this report) have identified some of the ways in which health care could tackle health inequalities in

the Finnish system. In particular, steps are needed to make sure that financially disadvantaged groups can benefit from primary and specialised health care in the same way as the rest of the population. It has also been considered part of the remit of health care to mitigate the effects of a lower socio-economic status on health and the consequences of illness (Mackenbach et al. 2002, 33). The health needs of people with less education, a low income, in blue-collar occupations and excluded from the labour market, should be key starting-points for the design and provision of health services. Furthermore, it would be important to reassess the system of service fees and other current practices from the point of view of the most disadvantaged groups (Manderbacka et al. in this report).

In the field of health policy, it would also be necessary to strengthen intersectoral cooperation in the search for ways to intervene in the causes of health differences and in implementing those interventions (cf. Dahlgren 1995). In the UK, for example, the Treasury has been actively involved in drafting health inequalities plans, and all Departments have contributed to planning actions aimed at reducing health inequalities (HM Treasury & Department of Health 2002, DH 2003).

There are firm indications that material living conditions and income level are closely involved in the development of health disparities (Lahelma et al. in this report, Laaksonen et al. 2005a). A current challenge in Finland is to find ways to curb the rapid growth of income differentials and particularly to reduce poverty in families with children (see Moisio 2006).

One particularly difficult area that again concerns various sectors and that from a health inequalities perspective has been largely neglected, is that of mental health. The socio-economic connections of mental health problems are even more complex than those seen in physical health, and they vary in mental health disorders of different severity (Ostamo et al. in this report). Socio-economic disparities in mental health are more pronounced in early adulthood and adulthood than in youth. For this reason it is crucial that the transitional stage to adulthood is given special attention with a view to prevention. Many of these actions lie beyond the realm of the health care system. A specific problem in the case of mental health is the severe shortage of services available (Manderbacka et al. in this report).

One area that can be reached and influenced by both health care and other policy sectors is that of lifestyles. Unhealthy living habits are one of the key mediating links in the chain connecting low socio-economic position to poor health (Prättälä in this report). Furthermore, unhealthy habits have a tendency to cluster in groups in a low social position. There are many ways in which

health care can influence individual health behaviours, both in primary health care (at child welfare clinics, community health centres, in occupational health care) and in specialised health care (e.g. in hospitals).

As far as socio-economic health inequalities are concerned, the most important health-related habits are drinking, smoking and dietary habits (see section 4.1 in this report). It is estimated that the adverse health effects of drinking and smoking account for up to half of the difference in life expectancy between blue-collar men and upper white-collar employees (Koskinen 2005).

In 2004 and 2005, the increase in alcohol-related mortality in Finland that followed with the decision to lower alcohol taxes in early 2004 and the consequent rise in consumption has primarily affected people in lower socio-economic status positions as well as men who live alone (Herttua et al. 2007, see also Valkonen et al. in this report). For reasons of public health it would be imperative to reduce alcohol consumption, but many of the measures with which that could be achieved fall outside the health sector realm. For instance, a substantial rise in alcohol tax would have a major impact on alcohol-related health disparities. Furthermore, overall alcohol consumption can be influenced by restrictions on advertising, licensing regulations and by retaining the retail monopoly system (see Helakorpi et al. 4.1.3 in this report).

Smoking is most common in lower socio-economic groups and the socio-economic differences in smoking have been increasing (Laaksonen et al. 4.1.2 in this report, Martelin et al. 2005). Smoking among vocational school students is twice as common as among upper secondary school students. It would be important to reduce smoking in these groups of youngsters. The tools available include the regulation of tobacco prices and availability, advertising bans and the promotion of non-smoking environments. An effective intervention to reduce smoking requires close intersectoral cooperation.

The same goes for diet and eating habits: in addition to actions taken in the health care field, effective interventions need to incorporate general business and industry policy measures, agricultural policy measures as well as pricing policy and taxation measures (see section 4.1. in this report).

In order to gain some idea of the impact of actions and decisions taken in other sectors on the health of different population groups, it is necessary to review and assess those impacts systematically. The suggestion put forward in the Health 2015 programme (MSAH 2001a) is that the negative and positive impacts of social strategies, programmes and plans should be assessed in terms of their health implications to population groups. Indeed, the assessment of health impacts should by default include an assessment of impacts on health *inequalities* (Ritsatakis et al. 2002). The aim would thus be to keep an eye on

the potential impacts of different decisions on different population groups. The importance of impact assessments that take account of health disparities was also emphasised in the Acheson report (Acheson 1988), which recommended that the impacts of all public decisions in the UK be assessed in terms of how they affected the distribution of health. In addition to national decisions and actions, it would also be important to assess the impacts of global and EU decisions on the health of the population and its various groups (e.g. Bambra et al. 2005).

TOWARDS A HEALTH INEQUALITIES STRATEGY

The goal of reducing health inequalities has figured consistently in Finnish health policy documents since 1986. The main lines of action set out in these programmes have focused, firstly, on the role of the health care system; and secondly, on individuals' health-related behaviours. None of the programmes so far have provided adequate tools for improving the position of the most disadvantaged groups, nor any tools for the effective reduction of socio-economic health inequalities.

The revised programme of cooperation in 1993 identified it as a key challenge to "*translate the research knowledge about health disparities and their causes into a concrete action policy both in health care and other sectors*" (MSAH 1993). A similar statement referring to broadly-based actions was included ten years later in Prime Minister Vanhanen's first Government Programme.

As we have seen then, health policy documents repeatedly make the point that in order to achieve the goal of narrowing health inequalities, it is necessary to adopt new and more sweeping approaches. The link between *aims* and *means* has assumed ever greater significance as the current public health programme, for the first time, sets a specific quantitative target to reduce mortality differences between population groups by one-fifth. In this context it has been pointed out that to set such quantitative targets, it is necessary first of all to know by what means those targets can be achieved (Leppo 1995). Furthermore, it has also been pointed out that there is no evidence that this approach of setting quantitative targets actually produces desired results (Baum et al. 1995, Diderichsen 2003); and finally that there is often a gap between these targets and implementation (Whitehead et al. 2001, 311). In Finland, too, it may be difficult to bridge this gap if no measures are available to promote the achievement of the goals. Potential executors of public health programmes have received only very little guidance on how those programmes should be implemented, and very limited means with which to support the attainment of

their goals. Some concern has also been expressed that unrealistic quantitative targets may even undermine the credibility of achieving a strategic objective if there is no strategic direction and if the practical lines of action are inadequate (Koskinen and Melkas 2002).

Even though we still have limited knowledge about the factors that lie behind health inequalities and above all about how these inequalities could be reduced, it would be ethically unsustainable to refrain from even attempting to address those differences. Key health policy objectives and statements on health equality are based on jointly prepared documents, not only in Finland but internationally as well. Apart from factors impacting health inequalities, it is important to assess the most likely ways in which those inequalities can be reduced. It is particularly difficult to know which measures would be the *most effective* in reducing health inequalities, and indeed it might make more sense initially to try and establish which factors could help to reduce those differences at all and to identify which policy fields and measures are needed in this endeavour in the first place. The WHO assessment of the Finnish policy of health promotion pointed out that a policy aimed at increasing health equality should be made a key area of development and implementation in intersectoral cooperation and at the national level (MSAH 2002c, 44). Other international assessments have also drawn attention to the fact that Finland still has not had strategy for reducing health disparities (Judge et al. 2005). A well grounded strategy would help to gain a comprehensive overview of the direction and concrete lines of action in reducing health inequalities at different planning levels (strategic, normative and operative) and at different operative levels (international, national, regional, municipal and third sector).

To summarise, the narrowing of health inequalities[2] is essentially dependent on a dual strategy. On the one hand it is necessary to improve the position of the most underprivileged groups in society, but on the other hand it should also be possible to reduce health disparities between different population groups. Insofar as the focus is on health in the total population, the health inequalities policy is concentrated on examining systematic differences in living opportunities, standards of living and lifestyles at different levels of the socioeconomic hierarchy. In other words, the attention is focused on the situation

[2] It should be reminded that socio-economic health inequalities and their trends are to some extent different in men and women. Gender health disparities are among the inequalities identified in the Health 2015 programme as targets for reduction. This aspect has received less attention in the general debate on health inequalities than the narrowing of socio-economic health disparities (in both genders). Given the scarcity of knowledge about how the problem could be addressed in general, the inclusion of the gender aspect makes matters even more complicated.

of the groups in the weakest position, but also on other groups by equalising health conditions between different socio-economic groups. (Graham 2004b, 125–126).

In devising a strategy and planning how to implement it, it might be useful to look at experiences from countries that have worked longer and more consistently to develop policy tools with which to narrow health inequalities (see Palosuo et al. 2004, Palosuo et al. 2006). The UK and Sweden, for instance, have during the past decade or two taken a more systematic approach than Finland to drafting health policy programmes and to outlining policy directions and action plans that might help to reduce health inequalities at different levels (e.g. Statens folkhälsoinstitut 2005, DH 2003). In the UK there have also been some attempts to assess whether the proposed measures have had the desired outcomes, and action plans have been modified accordingly (HM Treasury & Department of Health 2002, DH 2005).

It is obvious that devising a strategy or drafting lines of action will not alone suffice. Rothstein (1994, 17; cited in Miller 1987) has suggested that the achievement of social justice is based on two key premises. The first principle is that social processes are consciously steered and that political agents can influence them and thus try consciously to steer and shape society. The second requirement is that some force can be identified that has the power to drive change.

Indeed, apart from having a programme to reduce health disparities, it would be important to consider the process with which that programme can be driven forward (Rothstein 1994, 88). In addition, it is necessary to have an organisation that assumes overall responsibility for this process. Policy implementation also requires a political will to recognize and accept health inequalities as a social problem. The action taken to pursue the goals will ultimately decide whether health inequalities can be reduced (Bullock et al. 2001).

The most important information gaps must also be filled by appropriately targeted research on health inequalities. Internationally, there is a strong tendency to emphasise the importance of research concerned with the public health regime, which could compare and analyse the political, social, cultural, economic and organisational structures of different countries and their significance and associations with the distribution of health (Asthama et al. 2006). Further, it has been pointed out that more research is also needed into the associations between the welfare state system and health as well as into the position of disadvantaged groups in different welfare systems (Dahl et al. 2006, 197, 215–216).

These are important areas for research in Finland, too. It should also be added that there has been scarce research into opportunities for impacting

health inequalities. Indeed there is a need now for broader-ranging research in policy evaluation: this could help to establish whether different policies or interventions have succeeded in reducing health inequalities (outcome assessments) and via what routes these outcomes have been achieved (process assessment). Process evaluations could also be important for the assessment of policy design, implementation, outcomes and policy redesign, as well as for ensuring impact. This kind of policy evaluation will gain increasing significance now that Finland, at the time of writing this chapter, has prepared several programmes that are focused on health inequalities, such as the policy programme for health promotion and the action plan for the reduction of health inequalities (MSAH 2008).

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6 SUMMARY AND CONCLUSIONS

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This report is a compilation of data on socio-economic health inequalities in Finland and on how those inequalities have changed over the past quarter of a century. The descriptions are based on previously published research and more recent, unpublished sources. Furthermore, a large number of new analyses were conducted for this report. The main focus is on the population of working age, for which research evidence is most readily available. Wherever possible, children, young people and the elderly are also covered.

There are only few countries in the world that have as comprehensive data sources as Finland on changes in the population's health. Indeed, research on health inequalities has been carried out extensively in Finland, but so far there is no established mechanism for the follow-up of health inequalities, nor is there a regular reporting system on socio-economic differences in mortality.

In this report, socio-economic position is usually indicated by reference to the individual's education. Educational attainment is a relatively stable indicator when compared to, say, income and occupation, which may change even at a more advanced age along with career advances or illness, for example. In addition, relevant information on education is included in many research materials. Among other indicators of socio-economic position, we have used social class and level of income. Social class is defined on the basis of occupation and occupational position. Some results are reported according to labour market position.

The report starts out with a discussion of the underlying causes of health inequalities and the explanatory models used in different research traditions. These models provide important direction in the search for effective health and social policy tools with which to reduce health inequalities. In the light of current research, the major causes of health inequalities lie in differences in living conditions as well as in cultural and behavioural differences between different population groups. The report concludes with a discussion on the challenges of reducing socio-economic health inequalities in Finnish health and social policy.

The report covers the period from the early 1980s through to the early 2000s, which has seen some profound changes in Finnish society. It was not until towards the end of the 1980s that Finland eventually matured into a fully-fledged Nordic welfare state, complete with a universal social security system (e.g. Julkunen 2001). At around the same time, the post-war balance of power was in a state of upheaval: the East European socialist power bloc collapsed, while integration in Western Europe gathered momentum. In the wake of the economic recession of the early 1990s, unemployment in Finland soared to 17 per cent and has since recovered only slowly to the current fairly low level. After the recession, income and wealth differentials began to rise from what used to be a very moderate level. Poverty in families with children, the number of children taken into custody and a host of other problems began to escalate. In spite of these changes that affected different segments of the population with different force, no major changes were seen in the 1990s in mortality or in other indicators of the level of the population's health, and in spite of all the cutbacks, the Finnish social security system seemed to pull through the economic crisis without such major health crises that hit the systems of East European countries in the aftermath of their upheavals (Jäntti et al. 2000).

Nevertheless, during the 20–25 year period studied here, socio-economic inequalities in morbidity in Finland have by and large remained while inequalities in mortality have widened.

Mortality

According to the Health 2015 programme (MSAH 2001), socio-economic differences in life expectancy should be reduced by at least one-fifth by 2015. The results reported here on socio-economic mortality differences show that by 2005, there had been no movement towards this target; in fact the differences had intensified.

During the two decades from 1983 to 2005, the life expectancy of all men at the age of 35 increased by 4.6 years and that of women by 3.4 years. By this yardstick then, the overall health of the population improved considerably. However, in contrast to the targets of reduced health inequalities, the life expectancy difference between upper white-collar and blue-collar workers increased during that period by one year in both men and women. According to data for 2003–2005, the life expectancy of upper white-collar men aged 35 was 6.1 years longer than that of blue-collar men. The corresponding difference for women was 3.3 years. Educational mortality differences are equally sharp and they, too, have increased.

The increase in life expectancy is primarily attributable to reduced cardiovascular mortality. On the other hand, the increase in alcohol-related deaths has worked to slow the rise in life expectancy. These changes in mortality significantly widened the socio-economic differences in life expectancy because especially in the 1980s and 1990s, cardiovascular mortality decreased most rapidly in the highest social groups, while alcohol-related mortality increased most in the lowest groups.

In 2001–2005, cardiovascular mortality alone accounted for more than one-quarter of the 6.1-year life expectancy difference between upper white-collar men and blue-collar men, while alcohol-related deaths accounted for 13 per cent, and lung cancer, suicides, and accidental and violent deaths together for almost one-quarter. Among women, circulatory diseases accounted for a larger proportion and behavioural and accidental causes for a smaller proportion than among men. The higher breast cancer mortality of upper white-collar women acted to reduce the socio-economic differences in women to some extent, but the higher mortality of blue-collar women from other cancers worked in the opposite direction and increased those differences.

Another important observation from a health policy point of view is that socio-economic differences in mortality do not level out before old age, nor do they completely disappear even by age 85. There is no single overarching explanation for the changes observed in socio-economic mortality differences. In order to gain a clearer picture of these changes, it is necessary to explore in closer detail the role of different factors related to living conditions, lifestyles and the service system in different cause-of-death categories.

Self-rated health

Self-rated health improved among middle-aged Finns from the late 1970s to the early 2000s, but for young adults no consistent trend was seen (Manderbacka 2006). Educational differences were most pronounced in the early 1980s, but remained high in both men and women throughout the period under review (1979–2004). Labour market position also showed a close association with self-rated health: people at work were in better health than those who were out of work throughout the period concerned, but after the recession the health difference between the employed and unemployed began to widen again. However, during the last years of recession, the unemployed were on average in better health than before or after the recession. Education shows a clear association with self-rated health even after retirement: people aged 65–84 with nine years or more education rate their health as much better than those with less education.

Chronic morbidity

Differences in the prevalence of major diseases among working-age and older people in Finland have been analysed using materials collected in 1978–1980 for the Mini-Finland survey and in 2000–2001 for the Health 2000 survey. In the early 2000s, the proportion of people with a chronic illness was somewhat lower than 20 years earlier. The numbers living with at least one chronic illness were about 50 per cent higher in the lowest educational group than in the highest group. Educational differences in chronic morbidity decreased to some extent in the working-age population, but increased slightly in the elderly population.

Both in the late 1970s and early 2000s, many chronic diseases and syndromes affecting everyday life were more common in lower than higher educational groups. Socio-economic differences increased in some diseases, but decreased in others.

Socioeconomic differences in morbidity appear more stable than mortality differences, which have tended to increase in recent decades. One possible explanation for this discrepancy could be that many common chronic diseases such as musculoskeletal disorders have little effect on the risk of death. Another reason for this discrepancy could be that the prognosis of many diseases has improved as a result of better treatment, and people in higher socio-economic positions have probably benefited from this most.

Mental health

There is relatively little research into socio-economic differences in mental health, even though mental health disorders are a major public health problem and the most common cause of early retirement in Finland. Indeed, this is a difficult line of inquiry as the interpretation and diagnostic criteria of mental disorders tie in closely with social and cultural factors and their changes. Furthermore, causality between socio-economic position and mental health is often more complex than in many somatic diseases: on the one hand difficulties in everyday living expose to mental health problems, on the other hand early-onset mental disorders are known to adversely affect prospects of education, employment and starting a family.

The evidence available shows that there have been no major changes in the prevalence of severe mental disorders from the late 1970s to the early 2000s. Severe disorders are usually more common in people with the least education and low income, in blue-collar occupations and among the unemployed. However, it seems that in the working-age population less severe disorders such as

mental symptoms and experiences of stress have increased to some extent over the past couple of decades. The association of milder disorders with socio-economic position is less clear, and may even be opposite to that seen in the case of severe disorders.

According to the Health 2000 survey, there were no educational differences in the prevalence of severe depression and alcohol dependency, but unemployment was associated with both, especially among men aged 30 or over. Among young adults, however, the association of education with mental health was unequivocal: young adults (aged 18–29) with a basic education suffered from severe depression about twice as often as other educational groups. Almost one-third of young women in the lowest educational category had sometimes attempted to commit suicide, while for all women of the same age the proportion was about 4 per cent.

In the 1980s and 1990s mental and psychosomatic symptoms in young people showed only a weak association with the family's socio-economic position. However, family background and parental socio-economic position do influence factors related to school achievement and the formation of socio-economic position. Poor school achievement, short educational career and dropping out from education are associated with mental symptoms and problems.

In the population aged 65 or over, educational differences in mental symptoms seem to have softened somewhat during the past two decades. However, symptoms still occur more frequently in the population with a lower than a higher education.

Functional capacity

Overall, functional capacity in the Finnish population has improved in recent decades, although functional limitations do also vary by socio-economic position.

Both in the working-age and older population, people with a higher education have less difficulty than those with a lower education with ordinary everyday exercise and with many daily activities of self-care and household management. These differences remained unchanged from the late 1970s to the early 2000s. Socio-economic differences occur in sensory functions, such as the eyesight and hearing, too. Educational differences in vision among working-age women have decreased, while differences in sensory functions between other groups have remained.

The Health 2000 Survey was the first time that cognitive capacity was measured in a population-level health survey in Finland. In linguistic fluency and

memory tests persons with a higher education scored the best results both in the population aged 30 or over and in the age group 18–29.

Self-reported difficulties in social interaction have decreased considerably over the past 20 years, but their prevalence remains about twice as high in the lower as compared to the higher educational group. The proportion rating themselves as unfit to work has dropped from less than one-quarter to just under one-fifth in the past 20 years, but the educational differences remain as pronounced as before.

Healthy life expectancy

Healthy life expectancy was in this report examined in the population aged 25 or over by educational group. Healthy life expectancy varies even more by education than overall life expectancy. When illness is defined using the criterion of average or poorer self-rated health, the difference in years of healthy life between the population with a basic and higher education was 13 years for both men and women.

Lifestyles and health-related behaviours

There are quite clear socio-economic differences in the health-related lifestyles of working-age men and women. In the older population, by contrast, socio-economic lifestyle differences are less pronounced. The lifestyles of young people in secondary-level vocational institutions are much less healthy than those of upper secondary school students. Very little is known about the lifestyles of those young people who drop out of education after comprehensive school. In recent decades there have been both positive and negative changes in socio-economic lifestyle differences.

Smoking

Socio-economic differences in smoking have increased in the working-age population. Among men, there has been no change in the proportion of smokers in the lowest educational tertile, but men with more education have cut down on their smoking considerably. Among women, daily smoking in the lowest educational group has increased, but in other educational groups the prevalence of smoking remains unchanged. The differences in smoking are clear already among young people and are affected by the young person's own education and school achievement. Vocational school students smoke at least twice as often

as upper secondary school students. Among older men aged 65 or over, on the other hand, there have been no major socio-economic differences in smoking over the past couple of decades. The same applies to older women, the majority of whom have never smoked regularly.

Alcohol use

Total alcohol consumption has almost doubled in Finland since the early 1970s. In the working-age population, heavy alcohol consumption and binge drinking are more common in lower socio-economic groups, although the frequency of drinking is higher in higher socio-economic groups. The increase in alcohol-related deaths in 2004–2005 following the cuts in alcohol tax in Finland was almost exclusively attributable to groups outside the active labour force (Herttua et al. 2007). Among young people, binge drinking is more common than average among those with low school achievement and among vocational school students. In retirement age, relatively heavy alcohol use is most common in the group with the most education.

Dietary habits

The dietary habits of working-age people in higher socio-economic positions are more closely in line with current dietary recommendations than those of people in lower positions. People with the most education eat vegetables or berries and fruit more often and use butter less often than people with no more than a basic education. Similar differences are seen for young people as well as the elderly. In general, dietary habits have improved in recent decades, complying more closely with recommendations, and socio-economic differences in vegetable and fat consumption have decreased.

Physical activity

Leisure time physical activity has increased in the adult population over the past 25 years. In particular, working-age men in higher socio-economic positions have engaged in leisure time physical activity more frequently than others, and here the socio-economic differences have remained unchanged. Young people in lower socio-economic positions and with low school achievement are less physically active than other young people, and vocational school students are less active than upper secondary school students. In the elderly population,

those with a better education walk and take other exercise more frequently than older people with a low level of education.

Biological risk factors

Circulatory diseases are the single most important group of diseases that explain socio-economic differences in life expectancy. The major biological risk factors for circulatory diseases are elevated blood pressure, high serum cholesterol and obesity. These risk factors and their underlying factors are also central to the development of type 2 diabetes, which is now emerging as an increasingly common public health problem and which also increases the risk of circulatory diseases.

In the working-age population, elevated blood pressure is more common in lower than in the highest educational group. In women, relative body weight (BMI) varies markedly by education. Among men, those with the highest level of education are slimmer than others. According to the FINRISK study, the educational differences in these remained more or less constant from 1992 to 2002. In the Health 2000 survey, both obesity (BMI≥30) and abdominal obesity were most common in the group with the least education. Even among women as young as 18–29, obesity is most common among those with least education Educational differences in total serum cholesterol level are also clear among both men and women, and they have remained stable from one survey to the next.

All in all, there have been no marked changes in the educational differences in biological risk factors in the working-age population over the ten-year period from 1992 to 2002. In the early 2000s, the differences were more pronounced in the working-age population than in older people.

Use of health care services

Health care not only addresses and irons out health inequalities, but it can also maintain and strengthen those inequalities. Legislation in Finland requires that all people who live in the country are guaranteed access to equal and high-quality services. Some data are available on socio-economic differences in the use of health services, but very little is known about how service needs are met in different socio-economic groups.

There are some differences in the use of outpatient services in Finland that are attributable, at least in part, to the way that the service system is organised and funded. Occupational health services are used most often by high-income earners, when needs are assessed in relation to the morbidity and the age and

gender structure of population groups. High-income earners also use private medical services more often than others in relation to service needs, but low-income earners visit health centres more often than high-income earners relative to estimated need.

The use of dental services also differs between socio-economic groups. Overall, relative to need, high-income earners use dental services more often than people with a low income. However, health centre visits for dental care show a pro-poor distribution. In 2002, all age-related eligibility restrictions were removed from municipal dental care, and sickness insurance reimbursements were extended to apply to the whole population. The number of health centre visits as a proportion of all dental visits increased from 30 to 40 per cent in 1987–2004, and the number of visits to private dentists decreased. Inequality in dental services had decreased even before the 2002 reforms, but it continued to decrease somewhat after them as well.

There is very little research on the socio-economic distribution of the use of outpatient mental health services. The decision to contract psychotherapy services out to the private sector and to restrict social insurance benefits to the maintenance of work ability give to understand that there are not enough rehabilitative psychotherapy services for people who are excluded from the labour market. However, according to the Health 2000 survey, the type of treatment received by people suffering from depressive disorders was determined not by socio-demographic factors, but rather by the severity of their condition.

In the case of hospital treatments, too, there is evidence of socio-economic differences that cannot be attributed to service needs. In the late 1980s and mid-1990s, low-income earners received more general hospital treatments than high-income earners, which is consistent with the socio-economic distribution of morbidity in the population. However, surgical procedures were performed more often on people with a high income. These differences are most pronounced in the cardiovascular treatment. The increase in the number of coronary artery procedures in the 1990s narrowed these differences, but in the early 2000s coronary artery bypass grafting and angioplasty were still performed most often on high-income earners when assessed relative to need. Similar socio-economic differences are found in the use of preventive medication against myocardial infarction. There are corresponding differences in elective procedures such as endoprosthetic surgery of the knee and hip.

People with the least education have been admitted to psychiatric hospital for treatment much more often than people with a better education, and these differences widened in the early 1990s. However, the treatment periods for

people with the lowest education grew shorter and those for people with a higher education grew longer.

There has been very little research in Finland on socio-economic differences in the outcomes of treatment, but results on causes of death preventable by health care interventions, for example, indicate that there may be differences in the quality of care. The excess mortality of psychiatric patients is also indicative of potential shortfalls in treatment.

Service system reforms in the 1990s have contributed to increasing socio-economic inequalities. The rise in fees charged to health care clients and the cutbacks in psychiatric services in the 1990s affected low income and low position groups more than others. The differences seen in surgical hospital care may partly be attributable to the current system where medical services are divided between three sectors, viz. health centres, occupational health care and the private sector. This structure means that people in higher socio-economic positions have the best access to medical services, which via the pressure of referrals to hospitals is also reflected in hospital service use, particularly in the case of elective procedures.

Reducing socio-economic health inequalities in Finland

The goal of reducing inequalities in health has figured prominently in all national health policy programmes in Finland since the *Health For All 2000 programme* in 1986. In recent years health inequalities have also received increasing recognition as a social policy problem, as is reflected in the Ministry of Social Affairs and Health policy strategies (MSAH 2006) and a separate action plan to reduce health inequalities (MSAH 2008). However, there remains a scarcity of research in the field of social and health policy on how health inequalities have been affected by structural changes in society or by various political measures and reforms. There is also limited research into how health inequalities could most effectively be tackled.

Success in reducing health inequalities will require a concerted and collaborative effort by both health care and other sectors. Apart from its responsibility to develop operations in its own field, health care also has an important role as an expert and advocate in turning the attentions of other administrative sectors to the problem of health inequalities. However, there has as yet been only limited discussion in Finland on the role of health care in reducing health inequalities. Furthermore, as far as the specific roles and tasks of different sectors are concerned, it must be borne in mind that political and economic decisions with health implications are no longer taken only at the national, regional

and municipal level, but increasingly at the EU and global level as well. The Health 2015 programme as well as the National Action Plan to Reduce Health Inequalities call for a systematic assessment of the impacts of political and social measures upon the health and well-being of the population and their socio-economic distribution. However, these efforts and the development of the necessary tools are still in their infancy.

There has been some international debate on the question of how far measures addressing health inequalities should be focused on proximal factors that directly impact health, such as lifestyles and health behaviours as well as risk factors and exposure levels, and how far the focus should instead be on distal and underlying factors such as income, poverty, unemployment and living conditions. Most commentators seem to agree – and we share this conclusion in our report – that both distal and proximal approaches are simultaneously needed. The ability of universalistic policy to respond to the problems of inequality has also received discussion in Finland and in the international literature (Lundberg et al. 2008). Apart from universal measures addressed to everyone, there is also need for targeted measures tailored to the specific health needs of various disadvantaged groups.

Some countries have recently developed and adopted national strategies and action plans aimed at health inequalities reduction. The experiences gained in these countries could prove valuable in the Finnish planning effort, too. The WHO Commission on Social Determinants of Health has identified health inequalities reduction as a key strategy of health promotion worldwide (CSDH 2008, Marmot 2005, Marmot et al. 2008). It is obvious that Finland, too, must commit itself to improving the health of the most disadvantaged groups and the large intermediate classes so as to narrow the gap with the people in the most privileged position.

Conclusions

This report is the most comprehensive account to date on socio-economic health inequalities in Finland. As we have seen, socio-economic health inequalities remain pronounced and have been consistently so over the past few decades. There are very few areas where these differences have narrowed. By contrast mortality differences have widened. There are also increased differences in health risk factors, such as smoking, heavy drinking and obesity. Differences in dietary habits, on the other hand, have been decreasing. There are some areas in which the service system has failed to address the needs of different population groups in a fair and equal manner.

This report aims to give as broad an account as possible of health inequalities and help identify areas where knowledge gaps remain. The most persuasive evidence on health inequalities is provided by mortality data and life expectancy figures. The quality of the data available in Finland on socio-economic mortality differences is amongst the highest in the world: these data cover the entire population and are reliable. Data on health status, morbidity, health-related habits and risk factors are mainly obtained from interview and questionnaire surveys, which never achieve complete coverage. There is good reason to assume that we would observe somewhat greater morbidity and lifestyle differences if deprived groups were better represented in survey data. Separate studies are needed to investigate these groups' health and other problems. There has been no research to study how service needs are met in different socio-economic groups.

Indeed, there is a need to institutionalise a mechanism of population surveys (see Appendix) and to create a system for regularly monitoring and reporting on health inequalities in Finland. Further investment is needed in information systems so that proper allocation of health policy measures can be made and the follow-up of changes in public health assessed as specified in the targets of the Health 2015 programme, the National Action Plan to Reduce Health Inequalities and other policy documents. Health and social policy must also be systematically monitored and health inequalities investigated from the point of view of general well-being and the efficient operation of the welfare state.

The report also allows us to identify some key areas of policy and to put forward some recommendations. Some of these are related to general social policy measures, such as reducing unemployment, adult and child poverty and promoting equal education policy, employment policy and workplace development objectives. Others are related to tax policy, business and industry policy and control policy decisions aimed at facilitating the maintenance of health and healthy lifestyles. For instance, the reduction of socio-economic differences in mortality, morbidity and functional capacity requires that healthy lifestyles are promoted by means that are most effective in low educational groups, in blue-collar occupations, among low-income earners and their families. Special attention must be given to children and young people because many health-related lifestyles are established at a young age, and they therefore continue to influence the individuals' health throughout their life. It would also be important to develop strategies to extend the reach of services more effectively to socially and economically deprived groups. The needs of these people must be taken into account from the earliest planning stages. Services in mental health care, other outpatient health care and specialised health care must be increased

and expanded especially in those areas where shortages are the most acute. The growth of multiculturalism is also throwing up new challenges for tackling ethnicity and health inequalities.

Central government has a less prominent policy steering role than before in Finland. The Health 2015 programme and the Action Plan to Reduce Health Inequalities, for example, emphasise the role of local government in health policy implementation. However, central government and its various branches do continue to have an important role. Income distribution policy, alcohol and tobacco policy, and poverty reduction, for example, all call for national action. All actions and structures that have a bearing on public health should be geared both to reducing the unequal health gradient and improving health in the large population groups that have the most health problems and that contribute most to health inequalities. These are the best ways to improve the average health of the whole population.

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APPENDIX

SOURCE MATERIALS

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Health examination surveys

Health 2000 Health Examination Survey

Conducted in 2000–2001 under the coordination of the National Public Health Institute KTL, the Health 2000 Health Examination Survey involved interviews and health examinations of a sample of 10,000 persons representative of the adult population in Finland. The aim was to gain an in-depth view of health and functional capacity, their determinants as well as service use and service needs in the adult population. As well as taking interviews that lasted on average 90 minutes, the respondents completed several questionnaires. Respondents aged 30 or over (N = 8,028) also took part in a comprehensive health examination that involved nine stages. Persons aged 18–29 (N = 1,894) did not take the health examination. Some of the participants took part in various more in-depth examinations. The material collected in the field studies were complemented with a wide range of data compiled from different registers. Special effort was devoted to maximising the survey participation rate, and indeed key data items were obtained from about 93 per cent of the persons included in the sample.

The stages of data collection are illustrated in a separate Appendix table. All forms used in the Health 2000 project can be found on the project website (www.ktl.fi /terveys2000).

The Mini-Finland survey in 1978–1980 was a corresponding health examination survey conducted in the population aged 30 or over. The next comprehensive health examination survey is scheduled for around 2012.

Mini-Finland survey

The Social Insurance Institution conducted a health survey in a representative sample of 8,000 Finnish adults in 1978–1980. The Mini-Finland survey was aimed at gaining a comprehensive overview of the health and functional capacity, their determinants as well as service use and service needs in the adult population. The data were collected in a health interview, a comprehensive health

examination and by questionnaires. The participation rates were exceptionally high: 96 per cent took part in the interview and 90 per cent in the health examination. Since the baseline examination, the survey participants' health has been followed up using register data, and in 2001 more than one thousand participants from the Mini-Finland sample were re-examined in connection with the Health 2000 project.

FINRISK study

FINRISK studies are conducted by KTL once every five years in a sample of about 10,000 Finnish adults aged 25–64. The purpose of these studies is to collect data on factors associated with the most common public health diseases in Finland. The focus is on chronic disease morbidity in the population, the most important associated risk factors and lifestyles, as well as environmental and genetic factors. In 1997 and 2002 older persons aged 65–74 were also included in the sample.

The first data collections were carried out in connection with the North Karelia project in 1972 and 1977 when the sample was drawn from the regions of North Karelia and North Savo. In the 1980s, the regions of Turku and Loimaa were added to the sample and from 1992 Helsinki and Vantaa. In 1997 the province of Oulu was added as the fifth survey area, in 2002 the province of Lapland became the sixth. The survey has used a somewhat more comprehensive questionnaire than the AVTK survey on the Health Behaviour and Health among the Finnish Adult Population, but the health examination is of a relatively small scale. In 2002 the sample size was 13,500 and the participation rate in the various regions around 60–68 per cent.

Conscription examinations and health checks on arrival

The Finnish Defence Forces collect data on conscripts' fitness for military service and other health-related factors in connection with conscription examinations and health checks on arrival. Conscription takes place in all military provinces from September to November. It applies to all young men who turn 18 during that year, with the exception of those who have been accepted for voluntary service. At each garrison the Defence Forces organise health checks on arrival within 14 days for those beginning their military service.

Questionnaire and interview studies

Health and the Use of Health Services in Finland (TERVA)

The Finnish health care survey has produced assessments of the population's health, health services use and families' health care expenses in 1964, 1968, 1976, 1987 and 1995–96. In contrast to all other health surveys introduced here, the sampling unit for the TERVA studies is not the individual person but household. Data are collected for all members of the households included in the sample. In 1995–1996 the data were collected in personal interviews with more than 13,000 Finnish adults and children. As yet no decisions have been made on whether the TERVA studies will be continued.

Adolescent Health and Lifestyle Survey

Adolescent Health and Lifestyle Surveys have been conducted by the University of Tampere every other year since 1977. In these surveys data are collected by postal questionnaires from a sample of 10,000 adolescents representative of the Finnish population aged 12–18. In 2001 the response rate was 70 per cent. The focus of concern is the health status and lifestyle of adolescents, their relationship to the family and school, and leisure activities.

School Health Promotion Study

The National Research and Development Centre for Welfare and Health STAKES has conducted School Health Promotion studies among grade 8 and 9 comprehensive school students and among grade 1 and 2 upper secondary schools student since 1996. In 1996–2000, data were also collected from vocational school students. The surveys use nationally harmonised methods to collect data on the living conditions, school experiences, health and health habits of school students aged 14–18. The purpose is to support activities for the promotion of health and well-being in young people, particularly the development of student care and school health care. The basic results are reported separately for each school to those municipalities that contribute to the costs of running the survey. The survey makes it possible to monitor the development of health and health-related factors in school students aged 14–18 by school and by municipality and to compare these results across schools and municipalities. In even years the survey is conducted in the provinces of Southern Finland, Eastern Finland and Lapland, in odd years in the provinces of Western Finland and Oulu.

Health Behaviour in School-aged Children (WHO/HBSC)

Coordinated in Finland by the University of Jyväskylä, the WHO survey on Health Behaviour in School-aged Children has collected nationally representative questionnaire data in school classes in 1984, 1986, 1990, 1994, 1998 and 2002. The focus is on schoolchildren aged 11, 13 and 15. In 2002, the number of respondents in Finland was around 5,500.

Health Behaviour and Health among the Finnish Adult Population (AVTK)

The KTL survey on Health Behaviour and Health among the Finnish Adult Population (AVTK) has been conducted every spring since 1978 in a nationally representative random sample of 5,000 adults. In recent years the response rate has been about 70 per cent. For a quarter of a century now, the survey has provided valuable follow-up data on the prevalence of and changes in various factors impacting the health of the Finnish population aged 15–64. Data are collected, for example, on smoking, dietary habits, alcohol use, physical activity, height and weight, health status, health services use, oral health, and factors related to traffic safety. Questions are also included on the respondents' social and family status, their conceptions of health, changes in lifestyles, and awareness of national health promotion programmes.

Health Behaviour and Health among the Finnish Elderly (EVTK)

Since 1985, primarily at two-year intervals, KTL has conducted health behaviour surveys in the elderly Finnish population (EVTK). As from 1993, these surveys have been carried out in a sample of 2,400 persons representative of the Finnish population aged 65–84. Responses have been obtained from over 80 per cent. The content of the questionnaire is largely the same as in the survey on the adult population, but there are additional items on functional capacity and related factors, on the use of mobility and other aids, and on the need for help and receipt of help.

Work and Health Study

The Finnish Institute of Occupational Health monitors working conditions and occupational health through its Work and Health interviews. Conducted since 1997 at three-year intervals, these are structured computer-aided telephone interviews with some 3,000 persons aged 25–64 who have been randomly sampled from the population register.

Welfare and Services in Finland Survey (HYPA)

Conducted by the National Research and Development Centre for Welfare and Health (STAKES), the Welfare and Services in Finland survey (HYPA) is a panel-type survey that integrates telephone and face-to-face interviews, postal questionnaires and register data. The data are collected about once every three years. The aim is to produce up-to-date, reliable and comprehensive information on the welfare and well-being of people in Finland and on their use of welfare services. The bulk of the data for the HYPA survey is collected in telephone interviews with people aged 18–79 who live in mainland Finland; complementary data are compiled from register sources. The sample size for the 2004 wave of telephone interviews was 5,810 and the response rate 82.7 per cent. The interviewees were also asked whether they could be sent a separate postal questionnaire including psychometric questions unsuitable for telephone interview. In addition, data were collected in a separate sample of persons aged 80 or over. In 2006, this sample included 5,798 people, half of whom were new participants and half had participated in the first wave in 2004. The response rate was 83.7 per cent.

Statistics Finland Living Conditions Survey (ELO)

Statistics Finland has compiled interview surveys representative of the adult population (aged 15 and over) in 1978 (ELO78), 1986 (ELO86) and 1994 (ELO94). ELO86 and ELO94 used similar methods and their data contents were also largely similar. The number of interviewees in ELO86 was around 12,000, and the response rate was 87 per cent; the corresponding figures in ELO94 were around 8,600 and 73 per cent. Living conditions surveys are based on a Nordic model, and corresponding studies have also been carried out in Norway, Sweden and Denmark. Data are compiled on such aspects of living conditions as income, housing, education, employment, home and family, social relations, social participation and leisure activities, and health. The health indicators used are self-rated health, limiting chronic diseases, main disease categories, mobility limitations, limitations in daily activities, and somatic and mental symptoms.

Drinking Habits Survey

Initially conducted by the National Institute for Alcohol Research, which is now part of the National Research and Development Centre for Welfare and

Health, the Drinking Habits Survey is carried out at eight-year intervals and is focused on different situations of alcohol use, motives for alcohol use, and the actual use of alcohol. Since 1992 the survey has also included questions on drug use. The data are collected in face-to-face interviews in a sample of 4,000 persons aged 15–69.

Findiet Survey

KTL Findiet surveys are population studies that are carried out once every five years. Their purpose is to monitor the use of foods, nutrition intake and the nutritional state of the adult population (aged 25–64) in Finland. Findiet is conducted as part of the FINRISK survey. It provides information on the consumption of foods and food groups, the rhythm of meals, favourite foods in Finland, the intake of nutrients, diet problems in relation to nutrition recommendations, and the most important sources of nutrients.

Register sources and statistical materials

EKSY datasets

Living Conditions and Causes of Death (EKSY) is a series of datasets combining information on mortality and causes of death from several different sources, linking data from Statistics Finland's population censuses (from 1970) and/or longitudinal data from employment statistics (from 1987) with mortality follow-up data from the cause-of-death register. In some instances data are also included from Social Insurance Institution and STAKES registers. These datasets provide a useful platform for investigations of mortality for instance by socioeconomic position, family and labour market position, and region.

HILMO register

HILMO is the Finnish National Care Register that is maintained by STAKES. Register data are collected on somatic specialist care, inpatient care in health centres, specialised psychiatric institutional care, treatments involving surgical procedures, and from statistical sources on surgical procedures and day surgery. The data are collected annually from hospital discharge and care registers on the basis of the personal identification number: data items include the patient's municipality of residence, service provider, and the patient's admission, care and discharge. In the special field of psychiatry, data are additionally collected on medication, involuntary treatments and assessment of mental state.

FURTHER INFORMATION

Health 2000 Health Examination Survey: http://www.terveys2000.fi/indexe.html

FINRISK study: http://www.ktl.fi/portal/english/research__people___programs/health_promotion_and_chronic_disease_prevention/units/chronic_disease_epidemiology_unit/the_national_finrisk_study/

Adolescent Health and Lifestyle Survey: http://www.uta.fi /laitokset/tsph/nedis/nttt.html

School Health Promotion Survey: http://info.stakes.fi/kouluterveyskysely/EN/index.htm

Health Behaviour in School-aged Children: http://www.jyu.fi /liikunta/tervtiede/tervty/who.htm

Health Behaviour and Health among the Finnish Adult Population

AVTK: http://www.ktl.fi/portal/english/research__people___programs/health_promotion_and_chronic_disease_prevention/units/health_promotion_research_unit/health_behaviour_monitoring_systems/health_behaviour_monitoring_among_the_finnish_adult_population/

Health Behaviour and Health among the Finnish Elderly

EVTK: http://www.ktl.fi/portal/english/research__people___programs/health_promotion_and_chronic_disease_prevention/units/health_promotion_research_unit/health_behaviour_monitoring_systems/health_behaviour_among_finnish_elderly/

Work and Health Interviews: http://www.ttl.fi /Internet/Suomi/Aihesivut/

Tyoterveyshuolto/Tiedonlahteet/Kirjallisuus/tyo+ja+terveys.htm

Drinking Habits Survey: http://groups.stakes.fi/AHTU/EN/Drinking.htm

Welfare and Services in Finland Survey: http://groups.stakes.fi /HYRY/FI/Hypa/index.htm

Findiet: http://www.ktl.fi /portal/suomi/osastot/eteo/yksikot/ravitsemusyksikko/finravinto_-tutkimus/

HILMO: http://www.stakes.fi /FI/tilastot/tausta/Laatuselosteet/hilmoraportit.htm

NOTE: Many of the described studies have been conducted by the National Public Health Institute (KTL) and the National Research and Development Centre for Welfare and Health (STAKES), which as from 1 January 2009 formed the National Institute for Health and Welfare (THL).

Appendix table. Data collection for the Health 2000 survey.

AT HOME:	
90 minutes	INTERVIEW
30 minutes	FILLING IN QUESTIONNAIRE 1
AT HEALTH CENTRE:	
15 minutes	1 RECEPTION: information, symptom interview, etc.
15 minutes	2 MEASUREMENTS: height, body circumference, ECG, blood pressure
15 minutes	3 MEASUREMENTS: spirometry, bioimpedance, heel bone density
15 minutes	4 LABORATORY: drawing blood samples (100 ml), handling of samples
15 minutes	5 ORAL EXAMINATION: clinical oral examination, orthopantomography
15 minutes	SNACK, FILLING IN QUESTIONNAIRE 2
30 minutes	6 FUNCTIONAL CAPACITY TESTS: physical and cognitive capacity, vision and hearing
30 minutes	7 CLINICAL EXAMINATION: anamnesis and standard clinical examination, counselling
30 minutes	8 MENTAL HEALTH INTERVIEW: anxiety and mood disorders, substance addictions and psychoses
15 minutes	9 FINAL INTERVIEW: checking Questionnaires 1 and 2, handing out Questionnaire 3 and Dietary Questionnaire, information about further examinations
AT HOME:	
(100 minutes)	(HEALTH EXAMINATION FOR THOSE NOT ATTENDING THE HEALTH EXAMINATION PROPER AT THE HEALTH CENTRE)
40 minutes	FILLING IN QUESTIONNAIRE 3 AND DIETARY QUESTIONNAIRE
AT UNIVERSITY HOSPITALS AND RESEARCH INSTITUTES:	
	FURTHER EXAMINATIONS FOR SUBSAMPLES
FROM REGISTER SOURCES:	
	REGISTER DATA

Source: Aromaa A, Koskinen S, eds. Health and Functional Capacity in Finland. Baseline Results of the Health 2000 Health Examination Survey. Publications of the National Public Health Institute B12/2004, Helsinki 2004, p. 18.

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Note: The National Public Health Institute (KTL) and the National Research and Development Centre for Welfare and Health (STAKES) were merged to form the National Institute for Health and Welfare (THL) on 1 January 2009.

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