

# Cost Estimations and Funding Proposal Concerning the Basis for an Action Plan for Healthy Dietary Habits and Increased Physical Activity

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## Summary

This background data contains a cost estimation and funding plan in connection with the previously submitted assignment to develop a basis for an action plan for healthy dietary habits and increased physical activity comprising 79 draft measures. The cost estimations have been performed in cooperation and dialogue with key personnel at the relevant authorities and organisations along with representatives of the Swedish Association of Local Authorities and Regions (SALAR).

The costs have been estimated for 48 of the measures. Seventeen measures concerning municipalities, county councils and non-governmental organisations (NGOs) are given as recommendations. Fourteen of the measures are deemed possible to implement within existing budgets.

The total cost for the 48 estimated measures amounts to 355 million SEK in 2006. For the subsequent four years, the annual costs will be 572 million, 555 million, 582 million and 611 million SEK respectively. A large share of this funding will go to measures aimed especially at children and young people.

Unhealthy dietary habits currently give rise to substantial societal costs. Obesity-related diseases cost an estimated 3.6 billion SEK in direct medical costs in 2004. Indirect costs for loss

of production, a preliminary estimate for which amounts to about 12.4 billion SEK, must be added to this figure.

We propose that funding for the implementation of the action plan be transferred from Expenditure area 10 - Financial security for the sick and disabled. It is our assessment that the costs for sickness benefit, activity allowance and incapacity benefit could be substantially reduced if the proposed measures are implemented. As a suggestion, 0.31 per cent can be reassigned from items 19.1 - Sickness benefit and rehabilitation, etc., and from 19.2 Activity allowance and incapacity benefit, which together are budgeted at 114.3 billion SEK for 2006, to the implementation of the action plan. 0.45 per cent will need to be transferred from expenditure items 19.1 and 19.2 during 2007 and 2008. We will have to wait for the budgets before calculating a percentage for 2009 and 2010. The proposed funding can thereby be seen as an investment in health that may help reach the Government's target of halving sickness absence by 2008.

If funding is not possible within given budget frameworks in the future, there is still the option of levying a selective tax on certain products with a high fat or sugar content, mainly chocolate, confectionery and soft drinks, which should be studied in more detail as soon as possible.

## Assignment and methodology

The Swedish Government intends to put forward an action plan for healthy dietary habits and increased physical activity in the population. The objective of such an action plan is to implement measures to improve the conditions for healthy dietary habits and physical activity and thereby contribute to the overall public health aim: “to create societal conditions that will ensure good health, on equal terms, for the entire population.” The National Food Administration and the Swedish National Institute of Public Health were assigned the task of developing a basis for such an action plan. The basis was to contain proposals for measurable targets (including an objective for societal measures regarding healthy dietary habits), strategies for achieving the targets, measures with assigned lead actors, funding and cost estimations for the proposed measures. The assignment was reported to the Government on 9 February 2005.

Due to a lack of time, the commission was unable to neither perform a complete cost estimation of the draft measures nor develop a funding proposal. On 11 April, the agencies were therefore asked to supplement the assignment with cost estimations for all 79 measures and proposals for how they could be funded. The work was to be carried out in consultation with the Swedish Association of Municipalities and Regions and was to be ready for submission to the Ministry of Health and Social Affairs no later than 30 September 2005.

The cost estimations have been performed in cooperation and dialogue with key personnel at the relevant authorities and organisations. Two meetings have been held with the Swedish Association of Municipalities and Regions, which has participated in the commission. In addition, some information has been drawn from the consultation responses to the basis for an action plan. In cases where we felt that a response contained a constructive proposal for modifying a particular measure, we have performed the cost estimation on the modified proposal or on several different alternatives. In certain cases the lead actor was changed after discussion with the relevant parties. In a few cases, the costs first estimated have also been changed slightly. The funding principle has been developed based on a Estonian model.

Several referral bodies would have liked to have seen fewer and more focused measures whilst others felt it was a good idea to have many measures with many responsible actors. We stress that the problem of unhealthy dietary habits and sedentary lifestyles is so complex and so closely interwoven with social development in general that many actors and many different measures are needed to reverse the trend. No one single measure can achieve this. The benefit of the chosen approach is also that many actors have easily been able to identify their role in promoting healthy dietary habits and increased physical activity and have already initiated activities, for example within measures 32 and 33 (marketing targeted at children), measure 37 (dialogue with the food sector), measure 38 (health and agricultural policy), measure 50 (increased support to outdoor recreation organisations, measure 62 (health in the new Education Act), measure 66 (extended mandate to the National Centre for the Promotion of Physical Activity among Children and Young People), measure 76 (meal/mealtime organisation in elderly care) etc., or are planning for several of the proposed measures. It has been relatively easy for the Government Offices to assign special tasks to the relevant authorities even before the action plan has been written. Some measures in the area of consumer policy and education policy are currently being incorporated into relevant government bills. During the course of the work, we have found that some municipalities and county councils have used the document in discussions and have already started to implement certain measures.

Even if a great deal can be done with relatively limited means, we still wish to stress that both financial and personnel resources must be made available if we are to achieve measurable effects and lasting improvements regarding dietary habits, physical activity and body weight.

Appendix 1 contains a column with proposed starting-times for each of the 79 measures, with the exception of those given as recommendations. In this way, the measures have been prioritised to a certain extent, which we hope can act as a guide when the Government writes the action plan proper.

## Cost development if nothing is done

Society currently faces considerable costs for diseases related to unhealthy dietary habits and physical inactivity. Cost-of-illness studies estimate the costs of a disease and consist of three components: direct costs, indirect costs and humanitarian costs (intangible costs). Direct costs refer to resources for prevention and treatment. Obesity and obesity-related diseases were estimated in 2002 to cost about 3 billion SEK per year in direct medical care expenses by the Swedish Council on Technology Assessment in Health Care (2). This figure is the total costs for in-patient and out-patient care as well as the costs for medicinal treatment in out-patient care. The Institute of Health Economics (IHE), which has made calculations at the request of the Federation of Swedish County Councils, recently arrived at the same figures as The Swedish Council on Technology Assessment in Health Care. IHE's figures only cover the following disease diagnoses, type-2 diabetes, hypertension, stroke caused by hypertension, vascular spasm and acute myocardial infarction, which make up about 83 per cent of the total medical care costs caused by over-weight and obesity. Based on this assumption, the total medical care costs will instead be 3.6 billion SEK per year.

The costs for musculo-skeletal diseases and a number of cancer cases caused by obesity are unknown and have not been included (2).

### **Forecast for direct medical care costs related to obesity**

The Institute of Health Economics presented four scenarios, two of which make the assumption that the trend in overweight will slow down or decrease by 2005. Even though there are indications that the rate of increase in obesity has slowed down slightly in recent years (Figure 1), we limit the following discussion to the two scenarios in which a continued increase has been assumed. In scenario 1, the rate of increase in obesity is taken to be the same as that between 1980/81 and 1997/98. In scenario 4, the rate of increase is assumed to be more rapid, corresponding to what was observed in the United States during the period 1978-91. Figure 1 shows that the rate of increase has actually accelerated after 1996/97.

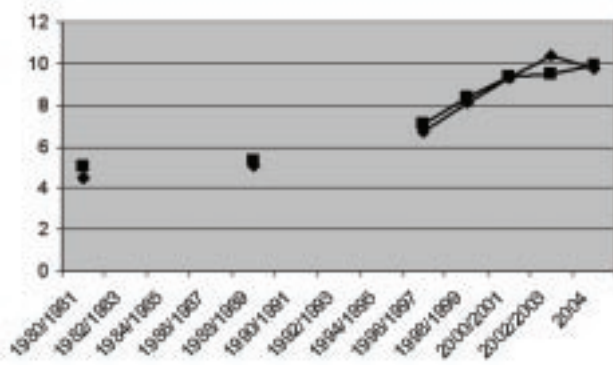
For the first time, we can see a decrease in obesity among men, which is mostly due to a dramatic reduction in obesity in the well-qualified white-collar workers group of 2.2 per cent between 2003 and 2004 (Figure 2). Major differences in prevalence and rate of increase can be seen between different occupational groups and the long-term unemployed/persons on dis-ability pension. Obesity occurs in nearly one in five of those who are long-term unemployed/on disability pension. The disease is hence nearly four times more common in this group compared to well-qualified white-collar workers. The cause and effect, i.e. whether people gain weight because they are outside the labour market or whether being excluded is due to discrimination and/or increased sickness absence as the result of obesity, is not possible to determine from these figures. It is clear, however, that the long-term unemployed constitute an important target-group for measures both from a prevention and a treatment point of view.

According to these "increase scenarios", the direct medical care costs for obesity and obesity-related diseases are within the interval 4.7 to 6.5 billion SEK per year in 2030 estimated at 2003 prices. If we assume that this constitutes 83 per cent of the total medical care costs, we end up in the interval 5.7 to 7.8 billion SEK. In a fifth scenario, the rate of increase is assumed to be as in scenario 4, the difference being that greater surgical intervention and more medical treatment to combat obesity are simulated. In scenario 5, the costs for 2030 amount to 9.6 billion SEK per year at 2003 prices.

### **Forecast for indirect costs related to obesity**

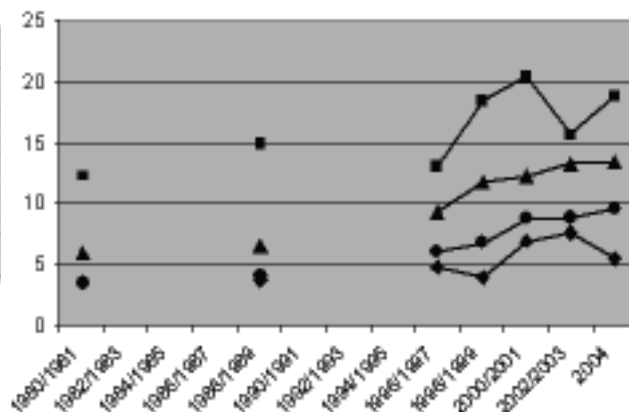
Indirect costs include the value of lost production as the result of impaired working capacity caused by disease or death. There are different methods of calculating them.

The human capital method values mortality and morbidity based on the individual's production potential, both as a gainfully employed person and when doing housework. This value is measured in terms of how much the employer is prepared to pay for the individual's



**Obesity in the population**

Figure 1. Percentage of obese individuals in the population, 16-84 years, ♦ = men, ■ = women (Living Conditions Survey, Statistics Sweden 2005, www.scb.se).



**Obesity in the population**

Figure 2. Percentage of obese individuals in different occupational groups (■ = persons on disability pension/long-term unemployed, ▲ = blue-collar workers, ● = lower white-collar workers, ◆ = well-qualified white-collar workers (Living Conditions Survey, Statistics Sweden 2005, www.scb.se)

work effort and should include employer social security contributions, pension payments, other benefits and taxes, in addition to salary. Future income must also be converted into a current value by discounting it.

The friction method presupposes that there are unemployed individuals who are able to enter the labour market and can compensate for the loss of production, given a certain level of unemployment. The production lost until the original level of production is restored is calculated as a cost (the friction cost).

Data on the costs for loss of production as the result of sickness absence or death before pensionable age caused by obesity is very limited and needs to be developed in Sweden. Within the framework of this assignment, the Institute of Health Economics (IHE) in Lund has performed a preliminary cost estimation of indirect costs as a result of disease related to overweight and obesity using the human capital method. The estimation covers loss of production as a result of sick-leave, disability pension and death before pensionable age. Data for this estimation has been collected from Statistics Sweden (Living Conditions Survey, population statistics, Statistical Year-Book) and a thesis from Göteborg University (4).

The findings from the study are presented in Table 1.

Table 1. Indirect costs for loss of production as a result of sick-leave, disability pension and premature death among overweight and obese individuals in Sweden in 2003 (SEK billions).

	Men	Women	Men and women	
Sick-leave	1.5	1.8	3.3	26
Disability pension	3.2	3.1	6.3	51
Premature death	2.4	0.5	2.8	23
<b>Total</b>	<b>7.1</b>	<b>5.4</b>	<b>12.4</b>	<b>100 %</b>
	<b>58</b>	<b>42</b>	<b>100 %</b>	

This should be seen as very preliminary figures, since the data on sick-leave and disability pension among overweight and obese individuals is very poorly documented. In the absence of such documentation, sick-leave and disability pension statistics reported from a small sample of women in Kristina Narbro's PhD thesis from 2001 have been used.

A comparison of the relationship between the direct and indirect costs in Sweden provide some evidence that the findings are not totally unrealistic. The latest cost-of-illness study presented for Sweden for 1991 showed that the indirect costs were nearly 3 times greater than the direct costs (5). IHE has previously estimated the direct health care costs as a result of overweight and obesity and found that they amounted to 3.6 billion SEK for 2003 (2). If these costs are put in relation to the indirect

costs of 12.4 billion SEK, we see that the indirect costs are 3.4 times greater than the direct health care costs, which is well in line with Jacobson and Lindgren's study (5).

### Humanitarian costs of obesity

Humanitarian costs describe pain, suffering and perceived impaired quality of life as a result of a disease. These costs are difficult to measure and are often ignored in cost-of-illness studies. These costs are probably quite significant for obesity and obesity-related diseases, since seriously obese people report a low quality of life (1). We must however weigh this against the enjoyment experienced while eating fatty and sugary food and being physically inactive.

All in all, this review shows that the societal costs for obesity and obesity-related diseases are significant and already amount to at least 16 billion SEK per year for men and women taken together. If this trend is allowed to continue, the costs will probably double by 2030.

### Societal costs of physical inactivity - Danish study

A first attempt to calculate the direct and indirect costs of physical inactivity has recently been made in Denmark (6). The analysis included diseases such as cardio-vascular disease, stroke, hypertension, cancer of the large intes-

tine, breast cancer, type-2 diabetes and osteoarthritis. The calculation showed that an average 30-year-old person, who changes his/her behaviour from physical inactivity to moderate physical activity can benefit in terms of life expectancy: 2.8 years for men and 4.6 years for women. If a person goes from physical inactivity to high physical activity, a man gains 7.8 years and a woman 7.3 years in life expectancy. A man who becomes moderately physically active in his thirties can avoid 2.4 diseased years. The corresponding figure for women is 2.7 years. A transition from inactivity to high activity increases healthy life expectancy by 4.0 years for a man and 4.8 years for a woman. The diseases for which time living with disease is reduced the most are stroke, hypertension and type-2 diabetes.

### Direct costs of physical inactivity

The Danish study estimated the direct health care costs that can be saved if a 30-year-old inactive man becomes moderately active at about 24,000 DKK (28,800 SEK at today's exchange rate) during the person's lifetime, subtracting the expected health care costs of his/her prolonged life (Figure 3). This amount is discounted by 5 per cent, which means that diseases later in life are discounted by 5 per cent per year compared to illness costs that occur earlier in life. The savings in health care costs per person are hence greater for older people, in whom the onset of diseases is more rapid.

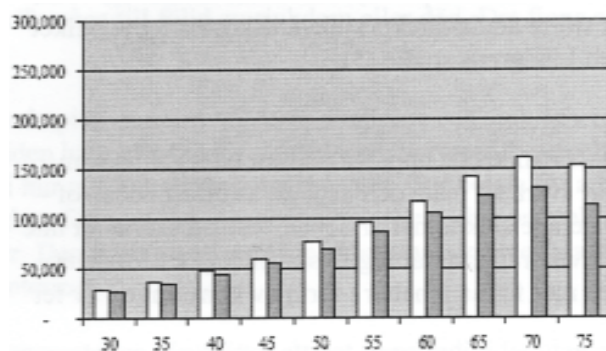


Figure 3: Potential net savings per person for health care costs per person for men and women in different age groups when a physically inactive person becomes moderately physically active (DKK, 2002 prices). □ = men, ■ = women

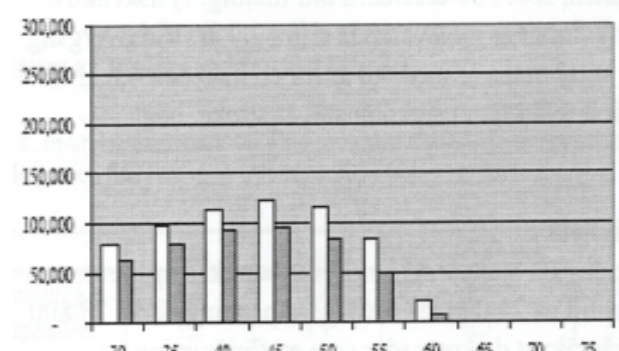


Figure 4: The value of potential productivity gains per person for men and women in different age groups when a physically inactive person becomes moderately physically active (DKK, 2002 prices). □ = men, ■ = women

### **Indirect costs of physical inactivity**

Production gains (indirect costs) derived from reduced sick-leave as a result of people going from physical inactivity to moderate activity are shown in Figure 4.

Figure 4 shows that society has most to gain from activating the middle-aged population. An average 45-year-old man who goes from physical inactivity to moderate activity increases the value of his production by 121,000 DKK (145,000 SEK) during his lifetime, based on 5-percent discounting. For a woman of the same age, the corresponding figure will be 98,000 DKK (118,000 SEK). After pensionable age, the production gain is counted as zero as gainfully employment has then ceased.

Using the friction method to calculate the value of increased productivity due to physical activity, the figures will be 7-8 times lower. This presupposes that a person on sick leave is replaced after 3 months by an unemployed person.

### **The Danish figures have been translated into Swedish conditions**

Fourteen per cent of the adult Swedish population is currently completely physically inactive in their spare time (National Public Health Survey 2005, Swedish National Institute of Public Health, unpublished). A simplified calculation is performed here in order to provide a rough estimate of the societal costs of physical inactivity in Sweden. All inactive persons (980,000 persons in total) are assumed to comprise 50-year-olds, half of whom are women. Discounting is set at 5 per cent. If all these go from physical inactivity to moderate activity, in accordance with the recommendation in this basis for an action plan, it would reduce net expenditure for health care costs (direct costs) by 72,000 SEK per man or about 35.3 billion SEK for all these men and by 60,000 SEK per woman or 29.4 billion for all these women for their remaining life expectancy. Added to this are the indirect costs in the form of productivity gains of 144,000 SEK per man or 70.6 billion SEK for all men and 96,000 SEK per woman or 47.0 billion for all women, all estimated at today's prices. From these simple calculations, it is clear that investing in measures to reduce a sedentary

lifestyle in the population is probably very beneficial from an economic point of view. There is probably considerable overlap with the costs for obesity, as some of the same diseases are included in the estimation.

### **Costs for medicinal products used for preventive purposes**

Medicinal products are used increasingly for preventive purposes. Treatment is administered to a large proportion of the population and often continues for many years, giving rise to substantial costs. Medicine used to lower blood pressure, blood lipids and blood sugar levels alone make up 15 per cent of the total costs for medicinal products, 80 per cent of which are funded by tax revenue. Statistics from Apoteket, the Swedish state-owned pharmacy monopoly, show that many medicines are used exclusively for disease groups that could be partly prevented or treated by improving dietary habits and increasing physical activity.

The statistics also show that medicines to combat lifestyle diseases cost over 4.5 billion SEK per year in Sweden (7). It is unclear what percentage of medical product costs could be saved by improving dietary habits and increasing physical activity, but it is probably more than half the above figure. Central government, county councils and municipalities could save large sums of money by implementing preventive measures.

## Costs for individual measures and in total

Measures, lead actors, costs for each measure and proposed starting-times for the measures are presented in Appendix 1. Comments on the calculation for each measure can be found in Appendix 2. Appendix 3 contains a cost estimation for the period 2006-2010 with yearly expenditure. Appendix 4 presents figures from the Swedish Association of Municipalities and Regions used to estimate the costs of necessary extra positions.

The costs have been estimated for 48 of the measures in total. Seventeen measures concerning municipalities, county councils and non-governmental organisations (NGOs) are given as recommendations. Fourteen of the measures are deemed possible to implement within existing budgets.

Total annual expenditure gradually increases over the 5-year period 2006-2010, for which we have chosen to estimate the costs. Total expenditure for 2006, 2007, 2008, 2009 and 2010 is presented in Appendix 3: 355 million, 527 million, 555 million, 582 million and 611 million SEK respectively.

## Funding principles

### Proposals for short-term funding

We propose that funding for the implementation of the action plan be transferred from Expenditure area 10 - Financial security for the sick and disabled, which covers the policy area Work incapacity compensation. As a suggestion, 0.31 per cent is taken from items 19.1 Sickness benefit and rehabilitation, etc., and 19.2 Activity allowance and incapacity benefit. In the 2006 budget, 38 billion SEK is allocated to item 19.1 and 75 billion SEK to item 19.2. Taken together, these items are allocated 114 billion SEK in the 2006 budget. 0.31 per cent of the budgeted appropriation for 2006 would cover the costs of the action plan during 2006. In 2007 and 2008, 0.45 per cent would have to be transferred from expenditure items 19.1 and 19.2 to cover the costs of the action plan. We will have to wait for the budgets before calculating a percentage for 2009 and 2010.

### Motivation

Since 2003, the aim of the policy area Work incapacity compensation has been:

*“Non-participation in working life due to sick-leave shall be halved by 2008 in relation to 2002 figures. The number of new cases of incapacity benefit and activity allowance shall concurrently decrease. Demographic trends during the period must of course be taken into consideration”.*

The Government has established an explicit objective to decrease expenditure in this area and according to a press release from the National Social Insurance Office on 2 August, the total costs of ill-health will already fall by 2 billion SEK next year. Rising alcohol consumption, increased overweight and smoking may explain some of the high sickness absence figures, even if these lifestyle factors are probably not the main causes (8). It is therefore likely that an investment in measures to promote healthy dietary habits and physical activity both at work and in leisure time, in accordance with the proposals in the basis for an action plan, could help to considerably reduce the costs of ill-health and hence contribute to achieving the Government's objective. This would be in line with the intentions of the

public health policy to increase efforts in health promotion and disease prevention rather than mere treatment.

Estonia has experience of funding health-promoting measures from a health insurance fund (Sirje Vaask, Estonian Health Insurance Fund, personal communication). The fund was established in 1993 by the Estonian Ministry of Health, following a demand from the World Bank prior to it authorising a loan to help finance health sector reforms in Estonia. Every year, 0.5 per cent of the fund's budget is made available for health-promoting activities and projects, which is just under 1 million EUR annually. This may seem a small amount, but bearing in mind the total absence of any public health efforts prior to 1993, it has nevertheless led to a dramatic increase in such efforts in Estonia, due to the establishment of a stable source of funding.

#### **Sick leave diagnoses related to dietary habits, physical activity and obesity**

In 2002, nearly 64,000 new sickness benefits or activity allowances were granted, which is 85 per cent higher than in 1998, when the figure was 34,000 (3). Seen as a whole, women are responsible for 63 per cent of sick leave cases lasting 15 days or longer. Concerning sickness benefit costs, women are responsible for a slightly lower share, 58 per cent, due to their lower level of benefit-qualifying income (9). Musculo-skeletal diseases, especially back, neck and shoulder problems, dominate the long-term sick leave cases. There are major social and sex differences in the occurrence of musculo-skeletal diseases. In 2002/03, these problems affected 55 per cent of female blue-collar workers but only 21 per cent of well-qualified male white-collar workers. Perceived distress from pain increased during the 1990s, compared to the beginning of the 1980s, especially among younger men and women. This increase was particularly large among women, more of whom relatively speaking also reported severe pain.

Several factors may be behind this trend, including physically hard work and/or repetitive and static working tasks. This also implies that a significant number of the problems can probably be prevented by means

of appropriate physical activity at work and in leisure time and by maintaining normal body weight.

The National Institute for Working Life has ascertained that the physical capacity of every fourth man and woman is insufficient for them to be able to carry out their working tasks and therefore proposes the introduction of compulsory physical exercise during working hours (10). The causes of sick leave are to be sought at work as well as in leisure time (8). If we are to come to grips with the high sickness absence figures, implementing measures at the workplace is not enough and we must also take action within all the proposed policy areas. The high sickness absence figures among young men and both young and older women are particularly worrying. In one study, seriously obese women have been shown to take between 1.5 and 1.9 times more days of sick leave than people of normal weight and are more likely to be on disability pension (4).

Table 2 presents all sick leave diagnoses and costs of diseases, the risks of which are increased by obesity and/or physical inactivity and/or unhealthy dietary habits (1,11).

It is clear from Table 2, that a very large proportion of current sick leave diagnoses are linked to unhealthy dietary habits, physical inactivity and obesity.

The common factor in all these states of ill-health is that they are long-lasting and hence very costly. Even if it is difficult to pinpoint the extent to which sick leave can be prevented by means of healthy dietary habits and physical activity, a reasonable assumption is that active efforts to promote public health within objective domains 9 and 10 would lead to a reduction in sick leave cases and activity allowance disbursements, which would at least cover the investment of 0.45 per cent of the total costs of incapacity benefit and activity allowance. The investment would no doubt be very profitable and have a rapid effect, especially regarding physical activity, and would help to achieve the Government's objectives within the policy area of Work incapacity compensation. Considerable net savings would also be made due to reduced health care costs and less loss of production.

Table 2. Percentage of sick leave cases and disbursed sickness benefit, for sick leave periods of 15 days or longer, relating to sick leave diagnoses for which unhealthy dietary habits, physical inactivity and/or obesity constitute a significant contributory factor (9).

Diagnosis chapter	Women		Men	
	Sick leave cases %	Disbursed sickness benefit %	Sick leave cases %	Disbursed sickness benefit %
II. Tumours	2.3	4.5	2.1	3.6
IV. Endocrine and metabolic diseases (incl. diabetes)	1.1	1.1	1.4	1.5
IX. Circulatory diseases	3.0	3.4	5.8	8.2
XIII. Musculo-skeletal diseases	31.6	33.8	35.1	38.1
Total	38.0	42.8	44.4	51.4

### Proposals for longer-term funding

In the basis for an action plan, measures are proposed to track the consumption of e.g. energy-dense food and soft drinks (measures 10 and 42), which contribute to greater obesity. If funding is not possible within given budget frameworks in the future, there is still the possibility of levying selective taxes on certain unhealthy foodstuffs, which should be studied in more detail as soon as possible. A tax on soft drinks and sweets corresponding to the

Danish and Norwegian levy of 2 SEK per litre of soft drink and 17 SEK per kg of sweets would provide an annual government income of 3.7 billion SEK and probably reduce consumption.

For it to be possible to implement this option in a few years time, the commission proposed in measure 54 and the conference proposed in measure 55 must be set up as soon as possible.

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