

## RESEARCH REPORT

## Class differences in the social consequences of illness?

C Lindholm, B Burström, F Diderichsen

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See end of article for authors' affiliations

Correspondence to:  
Christina Lindholm,  
Karolinska Institutet,  
Department of Public  
Health Sciences, Division  
of Social Medicine, SE-171  
76 Stockholm, Sweden;  
Christina.lindholm@phs.ki.se

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**Study objective:** To investigate adverse social consequences of limiting longstanding illness and the modifying effect of socioeconomic position on these consequences.

**Design:** Cohort study on the panel within the annual Swedish Survey of Living Conditions where participants were interviewed twice with eight years interval 1979–89 and 1986–97. Sociodemographic characteristics, self reported longstanding illness, employment situation and financial conditions were measured at baseline. Social consequences (economic inactivity, unemployment, financial difficulties) of limiting longstanding illness were measured at follow up eight years later.

**Setting:** National sample for Sweden during a period that partly was characterised by high unemployment and reduction in insurance benefits.

**Participants:** Participants were 13 855 men and women, economically active, not unemployed, without financial difficulties at the first interview and aged 25–64 years at the follow up.

**Main results:** Persons with limiting longstanding illness had a higher risk of adverse social consequences than persons without illness. The effect was modified by socioeconomic position only for labour market exclusion while the effects on unemployment and financial difficulties were equal across socioeconomic groups.

**Conclusions:** Labour market policies as well as income maintenance policies that deal with social and economical consequences of longstanding illness are important elements of programmes to tackle inequalities in health. Rehabilitation within health care has a similar important part to play in this.

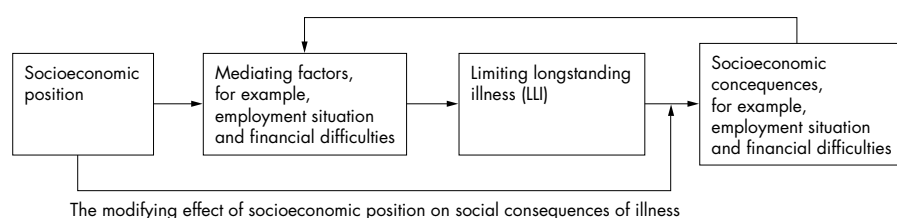
Sweden as well as most other rich countries has a highly developed system to protect the population from the economic effects of reduced working capacity because of illness. The Swedish system is characterised by a relatively high level of universalism and de-commodification. Benefits have been mainly proportional to earlier earnings rather than a flat rate of basic benefits for all, which means that the economic effects of limiting longstanding illness (LLI) in principle should be equal across different socioeconomic strata. We have in earlier studies shown that despite the extensive protections system, those falling ill in LLI are still suffering from increased risk of adverse social and economic effects in terms of unemployment, labour market exclusion and poverty.<sup>1</sup> These consequences are all at the same time social determinants of illness, which means that a feedback loop might exist where early stages of illness have social and economic consequences that might aggravate the further development of the illness. If the effect of illness on these social and economic consequences is differentially distributed across socioeconomic groups the mechanism might contribute to the inequalities in health across socioeconomic groups.<sup>2–12</sup>

Figure 1 illustrates these potential pathways leading to social consequences of LLI. Firstly, low socioeconomic position may increase the risk of being exposed to a number of mediating causes of illness including some social and economic conditions and thereby generating the relation between social position and illness. The longstanding illness might then have

social and economic consequences. Secondly, socioeconomic position may modify the effect of illness on social consequences. As some of the consequences of chronic illness also might act in the causal pathway there may be a feed back loop, as indicated in figure 1. It is important to notice that we are not indicating that long term illness changes the socioeconomic position of the individual, but rather that the illness changes some of the social determinants that are mediating the effect of social position on health.

Working life factors might provide an illustration. Manual workers have not only the highest risk for ill health but also report more (especially physical) job demands than non-manual employees do. The work limitation of a chronic illness may be more severe for manual workers than for non-manual employees. The severity in terms of suffering from illness may also vary with socioeconomic position. For instance, Eachus *et al* showed that the severity of hip pain increases with higher age but also that persons in lower socioeconomic position experience a greater severity of hip disease and a greater comorbidity than persons in higher socioeconomic position.<sup>13</sup>

**Abbreviations:** LLI, limiting longstanding illness; SES, socioeconomic status



**Figure 1** Model for studying the relations between socioeconomic position, adverse socioeconomic conditions and LLI.

### Key points

- Limiting longstanding illness increases the risk of adverse social and economic consequences.
- The risk of social and economic consequences of illness is highest among manual workers.
- The modifying effect of social position on social consequences of limiting longstanding illness is statistically significant only for economic inactivity.

Blank has shown on Swedish material that lower socioeconomic position not only had higher prevalence of long term illness but also a higher degree of discomfort and suffering.<sup>14</sup>

Social and economic consequences of chronic illness are indeed dependent on social and labour market policies and employment protection. Sweden has a relatively strong employment protection and an active full employment labour market policy.<sup>15</sup> The Job Security Act regulates redundancies applicable to people in the labour market.<sup>16</sup> These regulations provide persons with chronic illness a relatively strong protection against labour market exclusion. A complementary policy of medical and vocational rehabilitation in Sweden intends to provide persons with LLI the possibility to earn their own living in regular or sheltered employment.

The demand for low qualified labour has been steadily decreasing for decades but this process accelerated during the 1990s. This has reduced the employment opportunities for low qualified manual workers and particularly for persons with chronic illness. The effect of illness on employment is stronger in lower than in higher socioeconomic groups, but that interaction seems to be very much stronger in some countries (for example, Britain) than in others (for example, Sweden).<sup>11, 17</sup> These studies are however based on series of cross sectional data and not on studies with a longitudinal design.

The aim of this study is to investigate adverse social consequences of chronic illness across socioeconomic positions in the Swedish context. Mechanisms on the labour market might generate such an effect modification, while on the other hand Swedish labour and social policies might work in the opposite direction—equalising the effects across socioeconomic positions.

### METHOD

Our analyses are based on data from the National Survey of Living Conditions performed by Statistics Sweden 1979–1997. Each year, a random sample of approximately 6000–7000 people (aged 16–84 years 1980–1987 and with no upper age limit for 1988 and onwards) were interviewed. Within these samples around 2500 respondents were randomly selected every year to constitute a panel for being interviewed twice with an interval of eight years. The first interviews (at  $T_1$ ) with persons in these panels were carried out the years 1979–1989 and the second ones (at  $T_2$ ) in 1986–1997. The non-response rate in the survey was approximately 20%, and approximately 10% higher for the panels. Although only a small proportion (10%) of non-responders report illness, it is likely that persons with severe illness are underrepresented in the sample.<sup>18</sup> This may underestimate the effect of illness on adverse social consequences. An analysis of the non-response rate in the panels showed the same pattern as for cross sectional samples of the survey.<sup>19</sup> The panels consist of 27 773 persons. The interview questionnaire contained questions about various aspects of living conditions, including employment situation, labour market position, socioeconomic position, education, health, housing, social situation, and financial condition.

The panels make it possible to study social consequences of chronic illness and the modifying effect of social class with a longitudinal design. The cohort at the first interview ( $T_1$ ) is followed up at the second interview ( $T_2$ ) eight years later. The

exposure is chronic illness, here defined as LLI. Financial difficulties, unemployment and economic inactivity are the studied outcome indicators of social consequences. The study population is based on 27 773 persons in the panels and restricted to men and women aged 25–64 years at the second interview, who were economically active, not unemployed and who had no financial difficulties at the first interview. With these criteria, 13 855 subjects remained (12 235 persons without and 1620 with LLI). The decrease in the number of subjects was mainly because of the age limitation (27 773 to 20 623 persons) and the restriction to persons who had no financial difficulties at the first interview.

Chronic illness is measured by self reported LLI. The measure is created from affirmative answers to two questions from the interview.

(1) “Do you suffer from any long term illness, effects of injury, disability or other weakness?” followed up by the interviewer with other questions concerning the validity of the response and for later classification of the disease.

This question comprises any kind of longstanding illness. Approximately 40% of the Swedes report a longstanding illness.

The aim of the second question was to assess if the limitation imposed by the reported longstanding illness also affected the ability to work or to perform daily activities.

(2) “Does this illness limit your ability to work or to carry out your daily activities?”

With this restriction, the overall prevalence of LLI was approximately 20%.

In this study the measurement of social consequences among persons with and without LLI is restricted to three indicators on which the social and labour market policy may have an impact. Two of them measure the position in the labour market:

(1) “Economic inactivity”, comprising persons without any kind of employment (early retirement pensioners, housewives, full time students, long term unemployed or others outside the labour market) and

(2) “Unemployment”, comprising persons who are active job seekers.

The third indicator, “financial difficulties”, is measured by the respondents’ affirmative answer to having had difficulties in the past 12 months in managing running expenses, to pay the rents, or buying food.

We applied the classification of socioeconomic status (SES) by Statistics Sweden, based on the trade union affiliation and the customary education in the different occupation.<sup>20</sup> For power reasons skilled and unskilled workers were grouped together as manual workers and lower, intermediate and upper non-manual employees as non-manual employees. Initial analyses revealed differences between self employed and employed manual workers in a way that would bias the outcome result when comparing manual and non-manual employees. Among manual workers the self employed had a lower unemployment rate and a higher rate of economic inactivity than employed manual workers. The self employed manual workers with low education were therefore excluded from the analysis to avoid a bias of an effect of the employment situation on the social consequences among the manual workers.

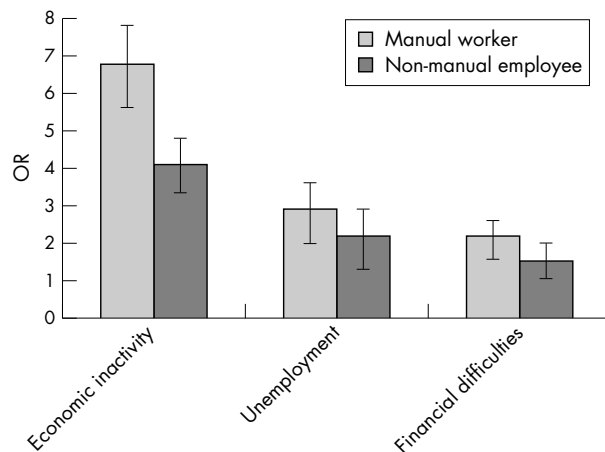
Age, marital status, sex, being foreign born and region of living were considered to have a potential confounding effect on the social consequences of LLI and were dichotomised and adjusted for in the analysis. The variables were dichotomised as follows: age was divided into a younger (25–44 year) and an older (45–64 year) age group, marital status (living alone=1, married/cohabited=0), being foreign born (born in another country=1, born in Sweden=0), region of living (residence in cities=1, other areas=0).

**Table 1** The cumulative incidence of adverse social and economic consequences at the eight years follow up among persons with and without limiting longstanding illness (LLI) in the total sample, among manual and non-manual employees (self employed excluded) stratified by age and sex

	Number		Cumulative incidence (%) of the studied indicators of social consequences at T <sub>2</sub>					
			Economic inactivity		Unemployment		Financial difficulties	
	LLI	No LLI	LLI	No LLI	LLI	No LLI	LLI	No LLI
Total sample 25–64 years	1620	12235	44.6	7.9	8.5	3.4	15.4	8.5
Manual workers	818	4630	52.3	6.9	9.3	4.3	16.7	8.8
25–44 years	269	2605	23.0	5.8	14.9	5.3	40.9	14.6
45–64 years	549	2025	66.7	8.3	7.1	3.9	4.9	3.0
Male	392	2332	48.0	4.9	12.0	4.6	18.6	9.5
Female	426	2298	56.3	8.9	8.5	4.7	15.0	9.5
Non-manual employees	665	6722	31.0	5.1	7.9	3.0	13.4	8.3
25–44 years	256	3464	9.0	4.0	7.0	2.9	17.2	10.3
45–64 years	409	3258	44.7	6.2	6.4	2.2	7.6	3.6
Male	286	3409	25.9	4.1	4.6	2.1	8.7	6.1
Female	379	3313	34.8	6.1	8.2	3.0	13.2	8.0

**Table 2** Odds ratios with 95% CI for the modifying effect of socioeconomic position, adjusted for age, sex, marital state, being foreign born and living region

Socioeconomic position	Economic inactivity		Unemployment		Financial difficulties	
	No LLI	LLI	No LLI	LLI	No LLI	LLI
Manual workers	1.44 (1.2 to 1.7)	6.78 (5.8 to 8.0)	1.81 (1.5 to 2.2)	2.88 (2.2 to 3.8)	1.44 (1.2 to 1.7)	2.24 (1.8 to 2.8)
Non-manual employees	1.0	4.07 (3.4 to 4.9)	1.0	2.15 (1.5 to 3.1)	1.0	1.57 (1.2 to 2.1)



**Figure 2** Odds ratios (OR) with 95% confidence interval (CI) of adverse social and economic consequences among persons with LLI compared with persons without LLI stratified for socioeconomic position, adjusted for age, sex, marital state, being foreign born and living region.

### Analysis

The modifying effect of socioeconomic position on the risk of adverse social consequences of LLI was analysed in the following steps.

Firstly, odds ratios (OR) of social consequences of LLI were estimated with 95% confidence intervals (CI) using logistic regression multivariate models with adjustment for age, sex, SES, marital status, region of living and being foreign born, stratified for manual workers and non-manual employees. Persons with LLI were compared with a reference group of persons without LLI at the second interview.

In a second step we analysed whether socioeconomic position modified the effect of LLI on adverse social consequences

among persons with LLI. Manual workers and non-manual employees with LLI were compared with a reference group of non-manual employees without LLI. The regression models were adjusted for age, sex, marital status, region and being foreign born.

In a third step analyses stratified by age (25–44 years and 45–64 years) and sex were carried out, adjusted for marital state, region, foreign born.

Finally, we analysed the mediating effect of labour market position on the risk of financial difficulties as a consequence of LLI among manual and non-manual employees. Non-manual employees without LLI were the referents. Three different definitions of adverse labour market position (unemployment, early retirement pension and either of these situations) were applied in the logistic regression model.

### RESULTS

The cumulative risk of adverse social consequences at T<sub>2</sub> (during eight years of follow up) among persons with and without LLI is shown in table 1. The risk of adverse social consequences was generally higher among those with LLI compared with those without and in general also higher among manual workers (independent of age and sex), than among non-manual employees.

Figure 2 illustrates the OR of economic inactivity, unemployment and financial difficulties among persons with LLI compared with persons without LLI, stratified by socioeconomic position and adjusted for confounding effects. Manual workers had higher OR than non-manual employees for consequences regarding all three indicators. The difference was statistically significant only for the risk of economic inactivity. In table 2 the modifying effect of socioeconomic position on the social consequences of LLI is presented, the reference group being non-manual employees without LLI. The modifying effect of social position was statistically significant only for the risk of economic inactivity, where manual workers had the

**Table 3** The mediating effect of position in labour market on the OR for financial difficulties of LLI among manual and non-manual workers at T<sub>2</sub>. Reference group is non-manual employees without LLI (95% CI)

	Model 1: OR adjusted for age, sex, marital state, foreign born, region	Model 1 + unemployment	Model 1 + early retirement pension	Model 1 + unemployment and early retirement pension
Manual workers with LLI	2.24 (1.8 to 2.8)	2.06 (1.7 to 2.6)	2.29 (1.9 to 2.8)	2.11 (1.7 to 2.6)
Non-manual employees with LLI	1.57 (1.2 to 2.1)	1.47 (1.1 to 1.9)	1.61 (1.2 to 2.1)	1.50 (1.2 to 2.0)
Manual workers without LLI	1.44 (1.3 to 1.7)	1.38 (1.2 to 1.6)	1.44 (1.2 to 1.7)	1.38 (1.2 to 1.6)
Non-manual employees without LLI	1.0	1.0	1.0	1.0

highest risk. Being a manual worker and having LLI acted synergistically in the sense that the excess risk of economic inactivity among those “exposed” to both factors ( $=6.78-1=5.74$ ) was higher than the sum of the excess risk among those “exposed” to only one of these factors ( $=(1.44-1) + (4.07-1) = 3.51$ ), table 2. A ratio—the so called synergy index, expressing this effect can be calculated ( $5.74/(0.44-3.07) = 1.61$  95% CI 1.2 to 2.1).<sup>21-23</sup>

Stratification by age showed that the statistically significant difference between manual and non-manual employees remained among those aged 45–64 but not among persons aged 25–44 years. In the younger age group the effect on financial difficulties was significantly higher among manual workers than among non-manual employees. The modifying effect of socioeconomic position was similar among men and women (data not shown).

Finally, we found that the economic effects of longstanding illness only partly is mediated through a changed position on the labour market, table 3.

## DISCUSSION

Our study suggests that manual workers with chronic illness have a statistically significantly higher risk of economic inactivity than non-manual employees. The results seem to support the hypothesis that the risk of adverse social consequences among persons with LLI is greater among manual workers than among non-manual employees. This modifying effect of socioeconomic position varied only slightly by age and sex. Finally, we found that an adverse position in the labour market slightly increased the risk of financial difficulties among manual and non-manual employees with LLI.

There are some limitations to the study. One issue is whether the interpretation of the “exposure”, with respect to severity or duration of the LLI, differs between socioeconomic groups. As mentioned in the methods section we followed up the cohort (subjects 25–64 years at T<sub>1</sub>, with none of the outcome indicators at T<sub>1</sub>) eight years after the first interview, with regard to the outcome indicators. The number of persons with LLI had increased from 580 to 831 from the first to the second interview. These additional 251 persons may have acquired LLI at any time within the eight years. The duration of LLI may have affected the risk of social consequences, especially economic inactivity. Among the persons with LLI, 60% of manual workers and 53% of non-manual employees reported duration of LLI of one year or more. This difference may result in a bias, but would not change our conclusions.

LLI is a self reported measure. The prevalence of LLI may be overestimated among manual workers compared with non-manual employees because, for instance, a person with physically strenuous work may classify the disease to be more limiting of the work capacity than a person with less strenuous work.<sup>24-27</sup> The proportion reporting more severe illness (defined as illness, strongly limiting the ability to work or daily activity) might then become higher among manual workers than among non-manual employees reporting LLI. However, the proportion of more severe illness was 33% among manual

## Policy implications

Tackling inequalities in social and economic consequences of illness is a major objective of social policies and rehabilitation. They might even contribute to the reduction of inequalities in morbidity as the social consequences of illness feed back into the further development of illness and disability. This study shows that universal social policies and health care in Sweden have not been able to tackle social inequalities of consequences in terms of exclusion from the labour market but seems to protect against inequalities in economic consequences of illness. Health care and particularly rehabilitation therefore has a potentially important part to play in reducing inequalities in disability.

workers with LLI and 28% among non-manual employees. Hence, this misclassification does not seriously bias the results.

Being economically inactive was one of the indicators of social consequences. Economically inactive persons are a heterogeneous group including students, disability pensioners, voluntarily early retired pensioners, long term unemployed, housewives and others. Thus, the group includes persons for whom the economic inactivity may be a voluntary choice. In the group of economically inactive persons, the proportion of early retirement pensioners was higher (70%) among manual workers compared with non-manual employees (59%) with LLI. Among persons with LLI the main reason for being economically inactive was early retirement pension (including disability pension and voluntarily early retirement pension) (61%) but obviously not among persons without LLI (6%). Our analysis does not measure whether the economic inactivity is a consequence of a choice of one's own or a forced consequence of working incapacity, for example, by LLI. In that way the measure could underestimate the adverse social consequences of LLI. One study from the Netherlands also shows a higher risk of economic inactivity among persons with ill health. Van de Mheen *et al* studied health in relation to mobility into and out of employment in a longitudinal study. Persons with less than good perceived health showed a higher risk for exclusion from employment, as a consequence of their ill health.<sup>28</sup>

The results of our study show higher odds ratios for social consequences of LLI among manual workers than among non-manual employees but the differences were statistically significant only for economic inactivity, which emphasises the importance to study these consequences separately. The results show the importance of labour market protection of persons with LLI to avoid the higher risk of unemployment particularly among manual groups where labour market demand is lower. The increased risk of financial difficulties was equally distributed across socioeconomic positions, which might indicate that the Swedish sickness insurance system works in a rather equitable way.

In order to reduce socioeconomic inequalities in the consequences of illness, efforts to prevent and ameliorate the

adverse social consequences of LLI should include increasing the possibilities for manual workers with LLI to stay in work. Those efforts should be concentrated to those groups where labour market exclusion is detrimental for health, which is particularly true for people with mental problems. Despite labour market regulations and social policy protecting for example persons with LLI, the study shows higher risks of unemployment and financial difficulties among persons with LLI compared with persons without illness, which could lead to further ill health. However, these mechanisms seem to work equally among different socioeconomic groups, which confirms our earlier finding that socioeconomic position in Sweden, at least compared with Britain, is much less important for the susceptibility to social consequences of longstanding illness.<sup>17</sup> The study therefore indicates that policies that deal with social consequences of illness are of great importance in tackling social inequalities in health, including policies for labour market regulations, vocational rehabilitation and income maintenance. This gives health care and social policy an important role in policies for health equity.

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Conflicts of interest none.

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## Authors' affiliations

**C Lindholm, B Burström, F Diderichsen**, Karolinska Institutet, Department of Public Health Sciences, Division of Social Medicine, Stockholm, Sweden

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