

Does chronic illness cause adverse social and economic consequences among Swedes?

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Scand J Public Health 2001; 29: 63–70

Background: In an international comparison, the Swedish welfare system has been known for universal coverage and high benefit levels. Perhaps this is the reason why very few studies recently have dealt with the social and economic consequences of long-term illness in Sweden. *Aims:* The research question raised here is therefore to examine chronic illness (defined as limiting longstanding illness, LLSI) as a causal factor contributing adverse financial conditions, unemployment or labour market exclusion. *Methods:* A longitudinal design was employed with data from a sample of 27,773 people interviewed twice (Swedish Surveys of Living Conditions performed by Statistics Sweden), including subjects ($n=12,556$) at interview I, without chronic illness or adverse socioeconomic conditions. *Results:* The odds ratios for labour market exclusion, unemployment, and financial difficulties among people who had acquired LLSI at interview II varied between 1.4 and 4.0 for the outcomes. The elevated OR decreased after testing for the mediating effect of social context and the labour market position for financial difficulties but remained significantly elevated. *Conclusions:* The results suggest that LLSI increases the risk of adverse financial conditions, unemployment, and of not being economically active.

Key words: financial difficulties, labour market exclusion, limiting longstanding illness, social consequences, social context.

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INTRODUCTION

In the research on health-related social inequalities, two principally different relationships may be distinguished between social factors and health: the influence of adverse socioeconomic conditions on health and the reverse – that illness has an adverse effect on socioeconomic circumstances (1–4). Much of the recent research on social factors and health has focused on the aetiological role of socioeconomic conditions (5–10). However, chronic illness may have social and economic consequences, for instance unemployment or exclusion from the labour market, and financial difficulties (11–19). Other studies have shown that such consequences may vary with social position, and are often more severe for people in lower social positions (20–24). In addition to social factors causing disease, socioeconomic differentials in social and economic consequences of disease may therefore feed back into the aetiological process and thereby contribute to socioeconomic inequalities in morbidity.

In the 1950s, studies demonstrated that illness was one of the strongest predictors of socioeconomic deprivation (25). Since then, the development of the

Swedish welfare state has come to include various social insurance schemes aimed at ameliorating the economic and social consequences of chronic illness. In some countries, public social insurance provides only a basic level of support (26). In Sweden, the aim is to provide allowances related to income in order to maintain a person's standard of living, also during illness (27). The social insurance system includes everyone resident in Sweden, and individuals with an income of at least US\$830 (1999) per year qualify for benefits. The right to get sickness or rehabilitation allowance to cover a loss of income in a period of illness and rehabilitation is unlimited in time but a doctor's certification is required. The level of compensation for loss of earnings has varied between 90% (1980s) to the minimum 75% (1993), and the present benefit is 80% of the income up to a maximum income level (US\$27,640 annual income, 1997). When the social insurance costs increased dramatically in Sweden at the end of the 1980s and in the early 1990s, the policy to meet the increasing rates of long-term sickness and disability pensions was to increase rehabilitation efforts of people with chronic illness (28–30). Efforts to reduce costs during the 1990s led to more restrictive practice in terms of eligibility while

the legislation has been kept unchanged. Swedish labour policy has also aimed to actively keep chronically ill people in the labour market, and rehabilitation of people with chronic illness has been more active in Sweden than in many other countries (31–35). Health care services are not free and an out-of-pocket fee of approximately US\$20–40 has to be paid for each visit up to a maximum of approximately US\$200 per year. The social insurance seems to offer a sufficient safety net for a person to keep in employment and maintain acceptable financial conditions in the case of chronic illness.

In the labour market, unemployment increased sharply and the employers slimmed their organizations in the 1990s. Manufacturing, engineering and the construction industry declined and the labour market asked for well-educated people in non-manual work. The new labour market did not have a demand for people with even slightly limited work capacity, caused by for example low education or chronic illness. These changes in the labour market and the changes to the social insurance system may have augmented the difficulties of people with chronic illness in the social context of the 1990s, in terms of participation in the labour force and an increase in the risk of financial difficulties.

The research question in this study was to examine chronic illness as a causal factor contributing to inferior living conditions. The hypothesis was that unemployment, economic inactivity, and financial difficulties might be consequences of chronic illness. In addition, we estimated the contribution of the person's employment status as a mediating factor and finally examined the modifying effect of the social context in terms of two time periods on the relationship between chronic illness and adverse social and economic consequences.

MATERIALS AND METHODS

Study design

We have used a longitudinal design based on data from the Swedish Surveys of Living Conditions 1975–97 performed by Statistics Sweden (36). A sample of approximately 7,500–11,500 people was interviewed every year. Within the sample a random subsample of about 2,500 people each year were selected for a panel that was interviewed twice with an interval of eight years. Altogether, 27,773 people were included in the panel. The proportion of respondents in the panel who took part in both the interviews was approximately, but not less than, 70% in each year group. The first interviews were done in the years 1979–90 and the second interviews in the years 1986–97.

To examine the causality in the association between chronic illness and adverse socioeconomic conditions we used a cohort design. Included were men and women, aged 25–64 years, who in the first interview (T_1) did not have any chronic illness (in this paper expressed as limiting longstanding illness, LLSI) or any of the studied socioeconomic consequences: financial difficulties, unemployment, or not being economically active. With these restrictions the cohort consisted of 12,556 people.

This cohort was followed up eight years later with a second interview (T_2) where the social consequences among people with and without LLSI were measured by the following outcome indicators: financial difficulties, economic inactivity, and unemployment. Figure 1 illustrates the study design with the two time periods expressing different social contexts.

Measures of illness

LLSI acquired between the first and the second interview is the “exposure”. LLSI is a self-reported measure of chronic illness, created from affirmative answers to two questions in 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 to check the validity of the answer and for later classification of the disease.
2. “Does this illness limit your ability to work or to carry out your daily activities.”

Measures of economic and social consequences

Adverse social consequences were defined as one or more outcomes measuring financial problems, unemployment, and economic inactivity. Financial outcomes were measured by three items:

1. “No disposable cash”, a negative answer to a fictive question: Could you raise 14,000 SEK (1995) in cash within a week, from your own account or borrow from relatives or friends? However, this question may also reflect the mental well-being of the respondent and a trust in the social network.
2. “Financial difficulties”, is an affirmative answer to having had difficulties in the last 12 months managing running expenses, paying the rent, or buying food.
3. “Social allowance” is an affirmative answer to the question asked of the respondents reporting financial problems: Have you received social allowance to pay for rent, food, or bills within the last 12 months?

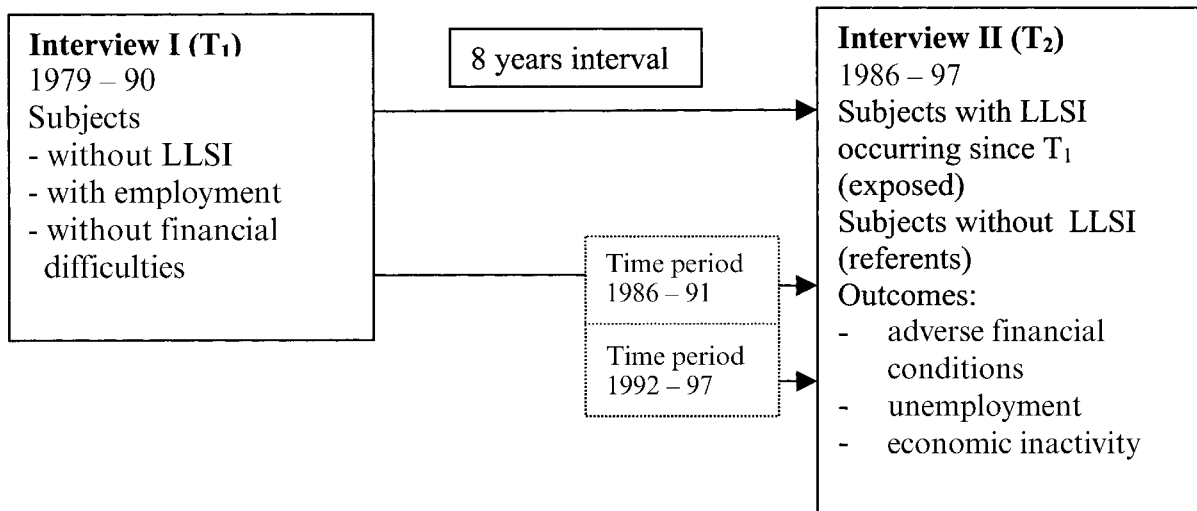


Fig. 1. Respondents at the first interview (T₁) with no LLSI, with employment, and with no adverse conditions studied as socioeconomic consequences at the second interview (T₂). At T₂ the OR is estimated for the consequences of LLSI and the modifying effect of time periods on the odds ratio.

An adverse employment position is measured by:

1. "Unemployment": unemployed, active jobseekers.
2. "Long-term unemployment": active jobseekers reporting unemployment for more than five months within the last year.
3. "Economically inactive": including early retirement pensioners, students, housewives, and others who for other reasons are outside the labour market.

Background variables

Three background variables, age, gender, and socioeconomic status (SES), were analysed as potential confounders: age was divided in 10-year groups (25–34, 35–44, 45–54, 55–64) where people aged 45–54 years were referents. The measurement of socioeconomic position was based on the classification by Statistics Sweden (37). Respondents were classified by their trade union affiliation and customary education in their different occupations. In this study we used five socioeconomic groups: unskilled manual workers, skilled manual workers, lower non-manual employees, intermediate non-manual employees, and upper non-manual employees. The self-employed were classified by education level into skilled workers or upper non-manual employees. The intermediate and upper non-manual employees were the reference group in the models.

Time periods

In the present study social context refers to two time periods (1986–91 and 1992–97). Macroeconomic conditions in terms of economic growth and

unemployment changed dramatically at the end of 1991. The time periods were chosen in accordance with the study of Living Conditions and Inequality in Sweden 1975–95 by Statistics Sweden, where four subperiods were identified with regard to rate of unemployment and work force participation. The average rate of unemployment was 3.7% in 1986–91 (1.6% in 1990, 3.0% in 1991, 5.2% in 1992) and with an average rate of work force participation in the labour market of 84.5% in the same period. The period 1992–97 was characterized by the highest rate of unemployment since the 1930s (on average 11.2%, 1992–95) and a declining rate of work force participation in the labour market (average 79.2%, 1992–95) (38, 39). The recession also led to reduced compensation and benefit levels in the social insurance and welfare systems, starting in 1992.

Analysis

The odds of financial difficulties, unemployment, and economic inactivity at the time of the second interview was compared among people who had acquired a LLSI since the time of the first interview and people who had not acquired a LLSI. The effect of LLSI on the outcomes (unemployment, economic inactivity, financial problems), is presented as odds ratios (ORs) with 95% confidence intervals (95% CIs) for each outcome, using logistic regression models.

The first analysis estimates the age- and sex-adjusted OR for each outcome, indicating social consequences of LLSI. In the following analysis the confounding effect of SES was assessed.

The next step was to study the association between

LLSI and social consequences in different social contexts. The modifying effect of time periods was analysed by period (1986–91 and 1992–97), according to the year of the second interview.

The outcome indicators of financial problems may be associated with the outcome measure of employment and economic inactivity. These individual conditions are strongly connected with the social context at the macro level. Hence, the position in the labour market was tested as a mediator for financial conditions stratified for time periods.

The analysis of financial problems and economic inactivity concerned 12,556 subjects while in the analysis of unemployment and long-term unemployment the early retirement pensioners were excluded and the number of subjects was 12,217.

RESULTS

The sociodemographic characteristics of people who had acquired a LLSI since the first interview show a predictable age and socioeconomic gradient (Table I). Older (55–64 years), and skilled and unskilled manual workers had a higher cumulative incidence of LLSI than did younger people and non-manual employees.

The prevalence of the studied outcomes are shown in Table II. The same table shows that age- and sex-adjusted ORs for social consequences of LLSI varied with the outcome (OR 1.9–3.4) but in every case were significantly higher than among people without LLSI. Adding SES to the model with age and sex increased the OR for economic inactivity but decreased the OR for the other outcomes. The socioeconomic position explained approximately 30% of the difference in lacking disposable cash and of having social

allowance if experiencing financial difficulties, but nothing of the OR for economic inactivity.

Separate analyses were done by time period (1986–91 and 1992–97). The results in Table III indicate a slight modifying effect of social context on the OR for social consequences, mainly on the position in the labour market, with a reduced effect in the later period. The absolute measure, however, shows a worse situation of people with LLSI in the second period compared with the first. The prevalence of the studied socioeconomic consequences increased from 1986–91 to 1992–97 among people both with and without LLSI. For all the studied outcome indicators the prevalence was higher among people with LLSI but the increase in prevalence between the periods was greater among people without LLSI. Figure 2 illustrates the prevalence differences between periods and people with and without LLSI. Although the results indicate a lower OR for adverse outcomes among people with LLSI in the second time period, the absolute level of adverse socioeconomic consequences was higher at that time compared with the first time period.

The labour market position was associated with the social context but as shown in Table IV it seems to have a slight mediating effect on the OR for financial problems of LLSI in the time period with high labour market participation (1986–91) and with some increasing effect in the time period 1992–97.

DISCUSSION

The aim of this paper is to explore the role of LLSI in causing adverse social and economic conditions. The study suggests that chronic illness may be a causal

Table I. Sociodemographic characteristics in the cohort at T_1 and among people at T_2 who had acquired LLSI

Characteristics	Subjects at T_1 without LLSI		No LLSI at T_1 , acquired LLSI at T_2	
	<i>n</i> = 12,556	%	<i>n</i> = 1,645	%
Age (years)				
25–34	2,429	19.3	213	12.9
35–44	3,764	30.0	343	20.9
45–54	3,765	30.0	470	28.6
55–64	2,598	20.7	619	37.6
Sex				
Male	6,750	53.8	825	50.2
Female	5,806	46.2	820	49.8
Social class				
Unskilled workers	2,548	20.6	479	29.7
Skilled workers	2,539	20.6	431	26.8
Lower non-manual employees	2,059	16.7	256	15.9
Intermediate non-manual employees	2,586	20.9	230	14.3
Upper non-manual employees	2,620	21.2	214	13.3

T_1 = first interview; T_2 = second interview; LLSI = limiting longstanding illness.

Table II. Prevalence (%) of the socioeconomic outcomes among people who acquired LLSI at T₂ and the age- and sex-adjusted OR with the added adjustment of SES (both with 95% CI) (referents are people without LLSI)

Socioeconomic outcomes	LLSI at T ₂		OR adjusted for age and sex	OR adjusted for age, sex, and SES
	%	n	OR (95% CI)	OR (95% CI)
Economic inactivity	22.7	373	3.39 (2.9–3.9)	3.50 (3.01–4.08)
Unemployment ^a	7.1	97	2.11 (1.7–2.7)	1.92 (1.51–2.45)
Long-term unemployment ^a	2.8	38	1.96 (1.4–2.8)	1.80 (1.24–2.60)
Financial difficulties	10.9	180	1.94 (1.6–2.3)	1.83 (1.52–2.20)
No disposable cash	8.1	133	2.05 (1.7–2.5)	1.73 (1.40–2.14)
Social allowance ^b	1.5	19	3.23 (1.9–5.5)	2.53 (1.40–4.58)

^aEarly retirement pensioners excluded.

^bAmong people reporting financial problems.

LLSI=limiting longstanding illness; T₂=second interview; OR=odds ratio; SES=socioeconomic status.

factor for financial difficulties and adverse labour market consequences. The labour market position seems to have a slight mediating effect on the risk of financial difficulties, especially in a time period of generally high unemployment rate and low rate of labour force participation.

Limitations of the study

LLSI was based on specific questions in the original data set. In the survey the question of illness was followed up with supplementary questions about symptoms, period of illness, and the doctor's diagnosis in an effort to validate the longstanding illness. However, there is no more objective measure of the longstanding illness or of the limitation caused by the illness. LLSI is the measure of the self-reported illness and the perceived limitation of one's own capacity for work or other daily activities. In spite of that, LLSI seems to be a useful measure and is validated in studies finding strong associations between scales in SF-36 and LLSI, especially for the physical functioning scale (40, 41). People with very severe

illness (especially severe mental illness) are usually underrepresented in surveys like the one used here, which might have underestimated the social consequences of LLSI. Among people with LLSI approximately 35–39% report a more severe degree of limitation in work capacity. This proportion did not change between the two time periods.

Secondly, the longitudinal design is chosen to make a causal interpretation possible. However, our results may be biased by the long (eight years) interval between the interviews. The acquired LLSI at the second interview may have been preceded by adverse social or financial conditions during the eight years between the first and the second interview. It is not possible to study the effect of such an occurrence with the present data. If, in the analysis in Table II, the individuals are included that already at the first interview had one of the outcomes, the ORs decrease only slightly, however.

Finally, the results might be biased by a confounding effect of time. For subjects interviewed for the second time in 1986–91, both interviews occurred in a

Table III. The OR for socioeconomic effects of acquired LLSI in the time period 1986–91 and 1992–97 (OR, with 95% CI, is adjusted for age, sex, and socioeconomic status; referents are people without LLSI)

Outcome variables	Time period 1986–91			Time period 1992–97		
	No LLSI (n=5318) %	LLSI (n=761) %	OR (95% CI)	No LLSI (n=5593) %	LLSI (n=884) %	OR (95% CI)
Economic inactivity	3.6	18.5	4.55 (3.49–5.92)	9.8	26.2	3.10 (2.56–3.75)
Unemployment ^a	1.3	2.0	1.76 (0.99–3.15)	5.8	9.4	1.95 (1.48–2.56)
Long-term unemployment ^a	0.3	0.8	1.99 (0.77–5.15)	2.2	3.6	1.73 (1.56–2.60)
Financial difficulties	6.0	8.2	1.89 (1.39–2.57)	9.7	13.4	1.77 (1.40–2.23)
No disposable cash	2.9	5.1	1.71 (1.17–2.50)	6.4	10.6	1.72 (1.33–2.22)
Social allowance ^b	0.2	0.7	^c	1.4	2.7	2.53 (1.29–4.99)

^aEarly retirement pensioners excluded.

^bAmong people reporting financial problems.

^cFew subjects: no possibility for an estimate.

LLSI=limiting longstanding illness; OR=odds ratio; CI=confidence interval.

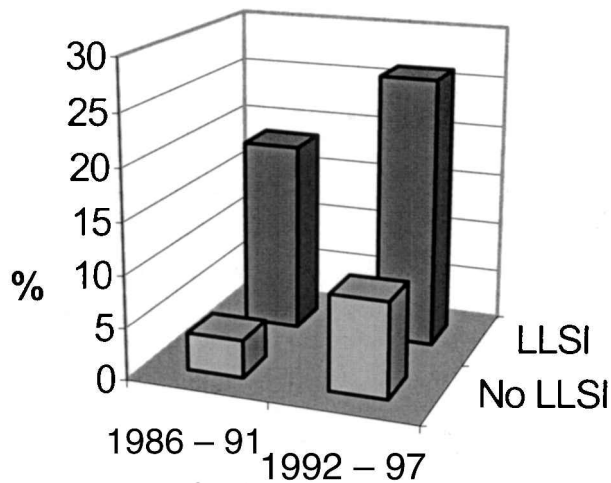


Fig. 2. The prevalence of economic inactivity among people with and without LLSI in the period 1986-91 and 1992-97.

more similar social context than for subjects interviewed for the second time in 1992-97, for whom the social context had undergone great differences between the two interviews. In the study of the modifying effect of time periods, only the social context for the second interview was taken into account. The data set has no first interviews in the time period 1992-97 so there is no possibility of assessing the effect of this bias.

Further time period bias could result from changes in the labour market and the selection of unemployed people. In times of low rates of unemployment and economic boom we can expect a higher proportion of people with social, physical, or mental handicap among the unemployed. In times of higher unemployment rates we can expect the composition of the

unemployed to be closer to the general population. The number of people with LLSI among the unemployed increased ($n=66$ versus $n=212$) but the proportion decreased from 26.7% to 24.8%, respectively, from 1986-91 to 1992-97. Hence, in the second period, the OR for adverse social consequences may be underestimated.

Furthermore, our definition of "economically inactive" includes those permanently as well as those temporarily economically inactive. The group consists of early retirement pensioners, housewives, students (studying full-time, older than 24 years), and others. Changes in these proportions between the two time periods could have affected the results. However, the proportions were stable over time.

We have found very few similar longitudinal studies on the effects on socioeconomic consequences of LLSI. There are other studies discussing social consequences but with a cross-sectional design which precludes a causal interpretation. A cross-sectional study by Bartley and Owen compared employment rates between men with and without longstanding illnesses in Britain in different socioeconomic groups, and the changes between 1973 and 1993 (19), and found social differences in exclusion rate. Manual workers with LLSI were worst affected when the unemployment rate increased in the 1980s but non-manual employees with LLSI seemed to be less protected from economic inactivity in the 1990s' recession. The paper concluded that the security of employment during periods of ill health is a seldom discussed aspect but may be important for health. However, the study did not address the issue of causality.

Two papers with a longitudinal design analysed the

Table IV. The mediating effect of position in the labour market on the effect of LLSI on financial outcomes in the two social contexts (OR, with 95% CI, is adjusted for age, sex, and socioeconomic status; referents are people without LLSI)

Financial outcomes	Time period I ($n=6,021$)			Time period II ($n=6,331$)		
	OR adjusted for age, sex, and SES	OR ₁ adjusted for age, sex, SES, and economic inactivity (95% CI)	% change OR ^a	OR adjusted for age, sex, and SES	OR ₁ adjusted for age, sex, SES, and economic inactivity (95% CI)	% change OR ^a
Financial difficulties	1.89 (1.39-2.57)	1.84 (1.35-2.51)	6%	1.77 (1.40-2.23)	1.60 (1.26-2.02)	22%
No disposable cash	1.71 (1.17-2.50)	1.61 (1.09-2.36)	14%	1.72 (1.33-2.22)	1.54 (1.18-1.99)	25%
Social allowance ^b	^c	-	-	2.53 (1.29-4.99)	2.23 (1.12-4.49)	31%

^aCalculated as $(OR - OR_1)/(OR - 1)$.

^bAmong people reporting financial problems.

^cFew subjects: no possibility for estimates.

OR = odds ratio; SES = socioeconomic status; CI = confidence interval.

associations between ill health and consequences. Arrow studied the negative health selection hypothesis, observing male and female German and foreign manual workers. The more vulnerable among the workers, females and foreigners, with chronic illness or long sick leave, had a higher risk of unemployment. Arrow proposes that health factors determining unemployment affect different workers in different ways, that aggregated analysis may be misleading, and that careful stratification should be used (21). The results of this study are in line with our conclusion that chronic illness (LLSI) elevates the risk of unemployment but it also points out the problem with aggregated data.

Van de Mheen et al. examined the influence of health on changes in occupational status and mobility into and out of employment, and did not find any relationship with occupational class mobility but to mobility into and out of employment. In their study, health problems at the first interview in 1991 were strongly associated with a higher risk of being out of employment at the next interview in 1995. Individuals outside the labour market at both times were the most unhealthy. The paper also concludes that exclusion from employment may result in lower income and financial difficulties in a downward spiral (42). The results of van de Mheen et al.'s study are in line with those of our study. Our results, however, show that the effect on financial difficulties only partly is mediated through employment status and some of the effect is mediated through other pathways, for example pathways related to illness and care.

CONCLUSIONS

In conclusion, the present study indicates that chronic illness causes adverse social and economic consequences. Although Sweden has a universal health insurance system with a broad coverage and high benefit levels, the results show both financial difficulties and consequences in the employment situation of a LLSI. The results may have implications for health policy by stressing the importance of increasing efforts according to the "work-line" which is rehabilitation to keep chronic ill people in the labour market. This was, however, only part of the effect. There also seems to be a direct effect on financial difficulties, indicating the importance of the need for benefit to cover the income loss, making it possible for a person with LLSI to retain the living conditions he or she had before the illness.

ACKNOWLEDGEMENTS

This study was supported by the Swedish Council of Social Research and Stockholm County Council in Sweden.

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