

- 28 Martínez-González MA, López-Fontana C, Varo JJ, et al. Validation of the Spanish version of the physical activity questionnaire used in the Nurses' Health Study and Health Professionals' follow-up study. *Public Health Nutr* 2005;8:920–7.
- 29 Bes-Rastrollo M, Pérez JR, Sánchez-Villegas A, et al. Validación del peso e índice de masa corporal auto-declarados de los participantes de una cohorte de graduados universitarios (Validation of the weight and body mass index self-declared by participants in a cohort of university graduates). *Rev Esp Obes* 2005;3:352–8.
- 30 Groenwold RH, Donders AR, Roes KC, et al. Dealing with missing outcome data in randomized trials and observational studies. *Am J Epidemiol* 2012;175:210–7.
- 31 Barros AJ, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. *BMC Med Res Methodol* 2003;3:21.
- 32 De Bacquer D, Van Risseghem M, Clays E, et al. Rotating shift work and the metabolic syndrome: a prospective study. *Int J Epidemiol* 2009;38:848–54.
- 33 Pietroiusti A, Neri A, Somma G, et al. Incidence of metabolic syndrome among night-shift healthcare workers. *Occup Environ Med* 2010;67:54–7.
- 34 Canuto R, Garcez AS, Olinto MT. Metabolic syndrome and shift work: a systematic review. *Sleep Med Rev* 2013;17:425–31.
- 35 Haus E, Smolensky M. Biological clocks and shift work: circadian dysregulation and potential long-term effects. *Cancer Causes Control* 2006;17:489–500.
- 36 Knutsson A, Bohhild H. Shiftwork and cardiovascular disease: review of disease mechanisms. *Rev Environ Health* 2000;15:359–72.
- 37 Turek FW, Joshu C, Kohsaka A, et al. Obesity and metabolic syndrome in circadian Clock mutant mice. *Science* 2005;308:1043–5.
- 38 Little RJ, D'Agostino R, Cohen ML, et al. The prevention and treatment of missing data in clinical trials. *N Engl J Med* 2012;367:1355–60.

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Sickness absence at a young age and later sickness absence, disability pension, death, unemployment and income in native Swedes and immigrants

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Background: Sickness absence with cash benefits from the sickness insurance gives an opportunity to be relieved from work without losing financial security. There are, however, downsides to taking sickness absence. Periods of sickness absence, even short ones, can increase the risk for future spells of sickness absence and unemployment. The sickness period may in itself have a detrimental effect on health. The aim of the study was to investigate if there is an association between exposure to sickness absence at a young age and later sickness absence, disability pension, death, unemployment and income from work. **Methods:** Our cohort consisted of all immigrants aged 21–25 years in Sweden in 1993 ($N=38\,207$) and a control group of native Swedes in the same age group ($N=225\,977$). We measured exposure to sickness absence in 1993 with a follow-up period of 15 years. We conducted separate analyses for men and women, and for immigrants and native Swedes. **Results:** Exposure to ≥ 60 days of sickness absence in 1993 increased the risk of sickness absence [hazard ratio (HR) 1.6–11.4], unemployment (HR 1.1–1.2), disability pension (HR 1.2–5.3) and death (HR 1.2–3.5). The income from work, during the follow-up period, among individuals with spells of sick leave for ≥ 60 days in 1993 was around two-thirds of that of the working population who did not take sick leave. **Conclusions:** Individuals on sickness absence had an increased risk for work absence, death and lower future income.

Introduction

Sickness absence is a common and widely used treatment, intended to give patients time to recover without losing their financial security when ill. The sickness absence rate in Sweden has fluctuated much and regulations and benefit rates have changed relatively often compared with other European countries.¹ The short-term economic consequences of sickness have been very low in Sweden as well in the other Nordic countries, with low barriers to access and a high compensation grade. It has been debated whether generous and easy accessible sickness benefits will increase the propensity to take sickness absence.

Ill-health is an important factor for exclusion from labour market but the sickness period itself maybe a risk factor for illness and later exclusion from labour market.^{2–4} Illness is required in order to have sickness benefit, but the sickness period in itself may hamper later employability. A Swedish study concludes that sickness absence also has an impact for later sickness which goes beyond the effect of ill-health.² In a qualitative study from Sweden, sick-listed persons regarded sickness absence to be a relief in the beginning. As time went by, however, the isolation and inactivity created emotional problems and alienation.⁵ Some individuals also believed that they were losing their independence when much of the decision making about their life was transferred to professionals.³ Long-term sickness

absence is connected to permanent work disability,^{6,7} but the risk for future spells of sickness absence appear to be high also among persons with repeated spells of short-term sickness absence. Even persons with a few spells of sickness absence have been reported to be at increased risk of future sickness absence.² There also seems to be an association between sickness absence and all-cause mortality.^{8–10}

Individuals on sickness absence seem to have a higher risk for unemployment than do individuals with low sickness absence.^{11,12} Health selection, that is, the fact, which illness makes it harder to get and maintain a job, may partly explain the association between sick leave and work absence.¹³ In a previous study, among persons on >6 months' sickness absence in 1995, only about 11% of women and 13% of men were in employment at the end of the 13-year follow-up period.¹⁴ A life on social benefits will decrease a person's income over a short period—but what about income in the long run? Persons with long-term sickness absence have been reported to have lower economic margins¹⁵ and will therefore in many cases face a life in relative poverty. In this young cohort, many of them have not been able to qualify for income based benefits from social insurances.

Sweden has, compared with many other countries, a relatively large immigrant population. In the 1950s and 1960s, immigration was mainly labour driven, but after 1970 many of the new immigrants were either refugees, or family members seeking reunification. Immigrants have a higher unemployment rate compared with native Swedes. Time since immigration and arrival at a young age has been seen to be decisive factors for future health status.¹⁶ Disability pension is more common among immigrants than in the native population, both in Sweden and in Norway.^{17,18}

Aim

The aim of this study was to investigate whether exposure to ≥ 60 days of sickness absence is associated with future (i) sickness absence, (ii) disability pension, (iii) death, (iv) unemployment and (v) income.

Materials and Methods

Study population

This study was a prospective cohort study based on registers. The study group comprised all immigrants aged 21–25 years who were living in Sweden in 1993 ($N = 38\,207$) and had immigrated to the country before 1990. A random sample of native Swedes of the same age group were also included ($N = 225\,977$). In this study, the term 'immigrant' refers to a person born in a country outside Sweden with two non-Swedish-born parents. 'Native Swede' refers to a person born in Sweden with two Swedish-born parents. The cohort was followed from 1994 to 2008. To form a cohort who was as healthy as possible and to reduce health selection to the cohort, the following were excluded from the analyses: individuals who received disability pension from 1990 to 1993, and individuals who were hospitalized between 1990 and 1993 with a pulmonary, cardiovascular, musculoskeletal or psychiatric diagnosis. Individuals who emigrated from Sweden during the follow-up were removed from the study at the time when they left Sweden because we had no sufficient data concerning their whereabouts.

Outcomes

We have divided the follow-up period into three periods of 5 years and the outcomes are:

- (1) ≥ 60 days of sickness absence (total days in each 5-year period)
- (2) Disability pension (granted from 1994 to 2008)
- (3) Death (from 1994 to 2008)
- (4) ≥ 100 days of unemployment (total days in each 5-year period)

- (5) Average yearly income from 1994 to 2008 (total income from work).

Statistical analysis

Hazard ratios (HRs) with 95% confidence intervals (CIs) were calculated for the studied outcomes using Cox regression in SAS version 9.3 (SAS Institute Inc., Cary, NC, USA). Potential confounders included in the analyses were age (continuous), income from work in 1992 (continuous), income from sickness absence from 1990 to 1992 (continuous), days of unemployment in 1992 (continuous), region of origin (12 regions), place of residence in Sweden (25 areas) and educational background (3 levels). All analyses were performed separately for men and women, and separately for native Swedes and immigrants.

Registers used

Data on unemployment, sickness absence, education, income, native country and residence were obtained from the Longitudinal Integration Database for Health Insurance and Labour Market Studies database, hosted by Statistics Sweden. Data on hospitalization were taken from the National Patient Register and information about time of death was obtained from the Cause of Death Register, both hosted by the Swedish National Board of Health and Welfare.

Results

Sickness absence, disability pension and death

Among native Swedes, individuals with ≥ 60 days of sickness absence in 1993 had more than four times (women) and seven times (men) as much sickness absence as individuals with no sickness absence in 1993 (Table 1). Women had more sickness days than men, and immigrants had more sickness days on average compared with native Swedes.

The HR for ≥ 60 days of sickness absence during each 5-year period was increased for individuals exposed to ≥ 60 days of sickness absence compared with individuals without any sickness absence in the same year (Table 2). The risk for future sickness absence was higher among men than among women. The risk for sickness absence was lower in the last two periods compared with the first period, but still significantly higher among persons on sick leave in 1993.

The HR for disability pension in the entire follow-up period was increased among persons on sick leave in 1993, but lower among women and immigrants (Table 3). The HR for death in the follow-up period was increased for all groups, but lowest among immigrant women (Table 3).

Unemployment and future income

Native Swedes on ≥ 60 days of sickness absence had about twice as many days of unemployment compared with individuals with no sickness absence (Table 1). The difference in numbers of days of future unemployment between immigrants on ≥ 60 days of sickness absence in 1993 and immigrants with no sickness absence in the same year was fairly small.

Exposure to ≥ 60 days of sickness absence in 1993 slightly increased the risk for ≥ 100 days of unemployment over a 5-year period (Table 4). The risk difference between men and women and between immigrants and native Swedes was fairly small. In the follow-up period, the average monthly income from work for individuals with ≥ 60 days of sickness absence in 1993 was approximately two-thirds of the income for individuals without sickness absence in the same year across all groups (Table 1). In general, immigrants and women had a lower income.

Table 1 Average days of sickness absence, average days of unemployment and average yearly income from work in 1993

		Days of sick-ness absence in 1993	Number of persons exposed to sickness absence in 1993	Average days of sickness absence, 1994–2008	Average days of unemployment, 1994–2008	Average yearly income, 1994–2008 (SEK)
Native Swedes	Women	No days	88 424	148	274	143 790
		≥60 days	3322	676	441	89 638
	Men	No days	100 260	66	282	221 993
		≥60 days	2199	457	474	148 323
Immigrants	Women	No days	16 266	205	530	101 020
		≥60 days	679	726	612	73 538
	Men	No days	15,490	106	609	139 062
		≥60 days	442	521	670	92 222

SEK- Swedish kronor (currency of Sweden) Individuals with ≥60 days of sickness absence compared with individuals with no sickness absence.

Table 2 Adjusted HR^a (95% CI) for ≥60 days' sickness absence for individuals on ≥60 days' sickness absence in 1993 compared with individuals with no sickness absence in the same year

		1994–1998		1999–2003		2004–2008	
		N	HR	N	HR	N	HR
Native Swedes	Women	1927	7.04 (6.62–7.47)	1,561	2.14 (2.01–2.28)	1,130	1.81 (1.69–1.94)
	Men	1078	10.14 (9.36–10.97)	604	2.35 (2.12–2.60)	442	1.88 (1.67–2.10)
Immigrants	Women	373	5.97 (5.20–6.84)	310	1.97 (1.71–2.26)	228	1.65 (1.40–1.93)
	Men	236	11.35 (9.44–13.58)	116	1.79 (1.40–2.26)	79	1.56 (1.17–2.04)

^aAdjusted for age, income in 1993, sickness absence during 1990–1992, unemployment in 1992, region of origin, residence in Sweden and educational background.

Table 3 Adjusted HR^a (95% CI) for disability pension and death for individuals on ≥60 days of sickness absence in 1993 compared with individuals with no sickness absence in the same year

		Disability pension		Death	
		N	HR	N	HR
Native Swedes	Women	1017	4.30 (3.95–4.68)	60	3.46 (2.46–4.76)
	Men	460	5.34 (4.69–6.05)	70	3.27 (2.42–4.34)
Immigrants	Women	200	2.96 (2.46–3.54)	7	1.18 (0.43–2.72)
	Men	123	3.93 (3.05–5.00)	16	2.80 (1.40–5.14)

^aAdjusted for age, income in 1993, sickness absence in 1990–1992, unemployment in 1992, region of origin, citizenship status and educational background.

Table 4 Adjusted HR^a (95% CI) for ≥100 days of unemployment for individuals on ≥60 days of sickness absence in 1993 compared with individuals with no sickness absence in the same year

		1994–1998		1999–2003		2004–2008	
		N	HR	N	HR	N	HR
Native Swedes	Women	1933	1.20 (1.14–1.27)	955	1.17 (1.09–1.26)	568	1.14 (1.04–1.25)
	Men	1292	1.14 (1.07–1.21)	597	1.20 (1.09–1.31)	334	1.09 (0.96–1.23)
Immigrants	Women	440	1.03 (0.92–1.15)	254	1.07 (0.92–1.23)	134	1.04 (0.86–1.26)
	Men	291	0.95 (0.82–1.09)	150	1.11 (0.92–1.34)	84	1.03 (0.80–1.31)

^aAdjusted for age, income in 1993, sickness absence during 1990–1992, unemployment in 1992, region of origin, residence in Sweden and educational background.

Discussion

Sickness absence, disability pension and death

In our study, taking sickness absence in 1993 increased the risk for sickness absence in all 5-year follow-up periods. This may be a consequence of a natural progression of a disease but it could also be a

consequence of the sickness absence itself. Sickness absence can in many cases lead to isolation and loss of essential factors for wellbeing, such as social support and structure in the person's everyday life.^{3,5,19} Sick leave due to musculoskeletal and psychiatric diagnoses, in most cases non-fatal diseases, represents over 80% of the total number of total sickness absence days in Sweden. There are,

despite that an increased risk of death among persons with musculoskeletal diagnoses²⁰ 'which may be an indication that the sickness period, with lost social support and lower economic margins, may lead to the development of more severe diseases. Another plausible explanation is an increased propensity to take sick leave due to musculoskeletal diagnoses among persons with more severe diseases'. Illness has been reported to be present in about 70% of the Swedish population, and chronic disease, certified by physicians, is prevalent in 30% of the population.²¹ The vast majority of people with health problems are not on sickness absence. Loisel et al.²² present a model regarding sickness absence where other factors like personal coping, relationships, legislative factors affecting health insurance, the health care system, etc have influence on who ends up in 'long-term sick leave or not'. In people with pain, there is a difference in, for example, fear avoidance and pain catastrophizing between persons who go on sick leave for pain and persons who stay on the job despite the pain.¹⁹ For a successful recovery, it is often better to be active and stay at work.⁸ Illness is a prerequisite for sick leave, the severity can hence vary substantially. Taking sick leave period may give a signal to employers of an increased risk of absence, especially in a situation when employers are co-financing the sickness benefit. There is a possibility that employers may select a worker without earlier sickness periods.²³ Taking sick leave may in that case be regarded as a mediator for later work absence. However, the sickness period may in itself be a risk factor for future work absence. The absence from work may lead to lost time structure, lost social contacts, low economic margins, etc. which are known risk factors for deteriorating health in unemployment research.²⁴

In one Swedish study the risk of further sickness absence was increased among persons on long-term sickness absence but also among persons with repeated short spells of sickness absence.² Older workers on permanent employment with ≥ 15 days of sickness absence have a 2-fold risk of future sickness absence compared with individuals with no sickness absence, while young persons have previously been reported to have no higher risk of future sickness absence in this case.⁸ In our study we found a higher risk also among young persons. One reason may be that there was exposure to a longer period of sickness absence in this study.

Sickness absence is in many ways similar to unemployment; research has found associations between spells of unemployment and later illness and unemployment.^{25,26} The age between 18 and 25 seems to be a decisive period in terms of beliefs about future employability²⁷ and in many cases, long-term sickness absence becomes an end point where return to work is unlikely. We have in this study tried to avoid selection bias at baseline by excluding individuals with earlier in-patient care and adjusting for previous unemployment and sickness absence.

Supplementary Figure S1 shows a model of a possible causal pathway between illness, unemployment and sickness absence. The arrow pointing from illness to unemployment shows a possible selection effect of ill persons into the unemployed group.²⁴ There may be a circular movement between unemployment, sickness absence and illness, whereby individuals get further and further removed from the labour market. Eventually this vicious circle may lead to disability pension and even premature death. The circular downward spiral can go on and exits can be death and disability pension. There is also a chance of re-employment. This chance, however, decreases with time.

Sickness absence is a predictor of disability pension, as shown in several studies.^{6,28} This may also be a plausible explanation as to why the risk of sickness absence decreased in the last two periods studied. Many of the persons on sickness absence were granted disability pension or died. In our study we found an increased risk for disability pension among this group. Disability pension in Sweden mostly implies benefits for the rest of the person's working life, when the decision is taken that the chance of the person returning to the

labour market is minimal. As with unemployment and sickness absence, disability pension per se may have detrimental effects on health. Most of the disability pensions are granted for non-fatal diseases; however, disability pensioners have three times increased risk of premature death as well as higher utilization of health care.²⁹

The risk of death among individuals with ≥ 60 days of sickness absence was more than doubled in all groups studied except immigrant women. Both another study from Sweden and a Norwegian study report an increased risk of death.^{9,30} The risk of death in those studies was lower compared with our study. Reasons for this discrepancy may be that the exposure in our study was ≥ 60 days, while in the Swedish study⁹ it was as low as 15 days in some cases; also, our cohort were younger.

Unemployment and future income

Sickness absence increases the risk of unemployment in the follow-up period, but to a fairly low extent. Employers sometimes have problems dealing with ill workers; they prefer employing healthy workers if available. Furthermore, economists have revealed that in good economic times there are more persons on sickness absence than during a recession.³¹ Reasons for this can be both behavioural (since in a boom your work is not at risk as much as during a recession) and also a selection effect (as in a boom time also a greater number of less healthy individuals are employed).^{12,32,33} This suggests that there is an interrelationship between unemployment insurance and sickness insurance.

This study, however, shows only a moderate effect of sickness absence on future unemployment. One explanation for this moderate effect may be that persons on sick leave may become locked into claiming sickness benefit instead of claiming unemployment benefits. The outcome is therefore very dependent on the context. Regulations regarding, for example, ceilings for replaced income loss, time limits, etc. can have a great impact. Finland and Sweden, which are fairly similar with regard to both welfare and the labour market, have different use of sickness absence and unemployment. In Finland, individuals are more likely to be on unemployment benefit while in Sweden, individuals are more likely to be on sickness benefit.³⁴ The risk of disability pension is also fairly high, with many going from sickness absence to disability pension. In Sweden, there have been arbitrage profits from migrating from unemployment benefit to sickness benefit but the flow from sickness benefit to unemployment benefit has been negligible.³⁵ Another Swedish study claims that sickness insurance and unemployment insurance may be different sides of the same coin, that is, benefits for work absence.³³ Among the included immigrants there was no difference in days of unemployment between individuals exposed to ≥ 60 days of sickness absence in 1993 and individuals with any sickness absence. This may be an indication of a weak association between sick leave and later unemployment in Sweden.

The income of persons with ≥ 60 days of sickness absence on average was about two-thirds of the mean income of persons with no sickness absence in the 15-year follow-up period. 'Around 3000 individuals in the study population were economically inactive during the entire follow-up period. They did not have income neither from work nor from social insurance, which may lead to an underestimation of all our studied outcomes. Immigrant women were overrepresented'. A study from Sweden shows that persons with long-term sickness absence have lower economic margins compared with persons with no such sickness absence after the sickness period.¹⁵ Economic deprivation is another cause of decreased wellbeing and disease. In an English study, unemployed persons suffered persistent economic scarring lasting almost three decades after the unemployment period.³⁶ In our study we found that during the 15-year follow-up period, individuals on sickness absence had a much lower income from work than individuals with no sickness absence.

Conclusion

Sickness absence is associated with a higher risk to be dependent on social benefits in the future. There is also an increased risk for mortality among persons on sickness absence. Whether the association is causal or not is not clear from our study.

Supplementary data

Supplementary data are available at *EURPUB* online.

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Conflicts of interest: None declared.

Key points

- Sickness absence among young adults was associated with elevated risk of sickness absence, disability pension and death in a follow-up period of 15 years.
- Sickness absence among young adults was also associated with elevated risk of unemployment and lower income from work in a follow-up period of 15 years.
- Immigrants have, in absolute numbers, more days of sickness absence and unemployment regardless of earlier exposure to sickness absence.
- The consequences on long-term employability and health might also be considered when granting sick leave.

References

- 1 Parlamentariska socialförsäkringsutredningen (S 2010:04); Sveriges socialförsäkringar i jämförande perspektiv - En institutionell analys av sjuk-, arbetsskade- och arbetslöshetsförsäkringarna i 18 OECD-länder 1930 till 2010. 2012.
- 2 Hultin H, Lindholm C, Malfert M, Moller J. Short-term sick leave and future risk of sickness absence and unemployment—the impact of health status. *BMC Public Health* 2012;12:861.
- 3 Lannerstrom L, Wallman T, Holmstrom IK. Losing independence—the lived experience of being long-term sick-listed. *BMC Public Health* 2013;13:745.
- 4 Staland Nyman C, Andersson L, Spak F, Hensing G. Exploring consequences of sickness absence—a longitudinal study on changes in self-rated physical health. *Work* 2009;34:315–24.
- 5 Ockander M, Timpka T. A female lay perspective on the establishment of long-term sickness absence. *Int J Soc Welfare* 2001;10:74–9.
- 6 Kivimaki M, Forma P, Wikstrom J, et al. Sickness absence as a risk marker of future disability pension: the 10-town study. *J Epidemiol Community Health* 2004;58:710–1.
- 7 Gjesdal S, Haug K, Ringdal P, et al. Sickness absence with musculoskeletal or mental diagnoses, transition into disability pension and all-cause mortality: a 9-year prospective cohort study. *Scand J Public Health* 2009;37:387–94.
- 8 Virtanen M, Kivimaki M, Vahtera J, et al. Sickness absence as a risk factor for job termination, unemployment, and disability pension among temporary and permanent employees. *Occup Environ Med* 2006;63:212–7.
- 9 Mittendorfer-Rutz E, Kjeldgard L, Runeson B, et al. Sickness absence due to specific mental diagnoses and all-cause and cause-specific mortality: a cohort study of 4.9 million inhabitants of Sweden. *PLoS one* 2012;7:e45788.
- 10 Vahtera J, Pentti J, Kivimaki M. Sickness absence as a predictor of mortality among male and female employees. *J Epidemiol Community Health* 2004;58:321–6.
- 11 Bambra C, Norman P. What is the association between sickness absence, mortality and morbidity? *Health Place* 2006;12:728–33.
- 12 Hesselius P. Does sickness absence increase the risk of unemployment? *J Socio Econ* 2007;36:288–310.
- 13 Lundin A, Lundberg I, Hallsten L, et al. Unemployment and mortality—a longitudinal prospective study on selection and causation in 49321 Swedish middle-aged men. *J Epidemiol Community Health* 2010;64:22–8.
- 14 Wikman A, Wiberg M, Marklund S, Alexanderson K. Activities and sources of income after a period of long-term sick leave—a population-based prospective cohort study. *BMC Public Health* 2012;12:745.
- 15 Bryngelson A. Long-term sickness absence and social exclusion. *Scand J Public Health* 2009;37:839–45.
- 16 Leao TS, Sundquist J, Johansson SE, Sundquist K. The influence of age at migration and length of residence on self-rated health among Swedish immigrants: a cross-sectional study. *Ethn Health* 2009;14:93–105.
- 17 Claussen B, Smeby L, Bruusgaard D. Disability pension rates among immigrants in Norway. *J Immigr Minor Health* 2012;14:259–63.
- 18 Osterberg T, Gustafsson B. Disability pension among immigrants in Sweden. *Soc Sci Med* 2006;63:805–16.
- 19 Westman AE, Boersma K, Leppert J, Linton SJ. Fear-avoidance beliefs, catastrophizing, and distress: a longitudinal subgroup analysis on patients with musculoskeletal pain. *Clin J Pain* 2011;27:567–77.
- 20 Jansson C, Mittendorfer-Rutz E, Alexanderson K. Sickness absence because of musculoskeletal diagnoses and risk of all-cause and cause-specific mortality: a nationwide Swedish cohort study. *Pain* 2012;153:998–1005.
- 21 Wikman A, Marklund S, Alexanderson K. Illness, disease, and sickness absence: an empirical test of differences between concepts of ill health. *J Epidemiol Community Health* 2005;59:450–4.
- 22 Loisel P, Buchbinder R, Hazard R, et al. Prevention of work disability due to musculoskeletal disorders: the challenge of implementing evidence. *J Occup Rehabil* 2005;15:507–24.
- 23 Kaye HS, Jans L, Jones E. Why don't employers hire and retain workers with disabilities? *J Occup Rehabil* 2011;21:526–36.
- 24 Janlert U, Hammarstrom A. Which theory is best? Explanatory models of the relationship between unemployment and health. *BMC Public Health* 2009;9:235.
- 25 Helgesson M, Johansson B, Nordqvist T, Lundberg I, Vingard E. Unemployment at a young age and later sickness absence, disability pension and death in native Swedes and immigrants. *Eur J Public Health* 2013;23:606–10.
- 26 Helgesson M, Johansson B, Nordqvist T, et al. Unemployment at a young age and later unemployment in native Swedish and immigrant young adults. *Mod Econ* 2014;5:24–31.
- 27 Giuliano P, Spilimbergo A. *Growing Up in a Recession: Beliefs and the Macroeconomy* 2009. Working Paper 15321 National Bureau of Economic Research <http://www.nber.org/papers/w15321>.
- 28 Gjesdal S, Ringdal PR, Haug K, Maeland JG. Long-term sickness absence and disability pension with psychiatric diagnoses: a population-based cohort study. *Nord J Psychiatry* 2008;62:294–301.
- 29 Wallman T, Wedel H, Johansson S, et al. The prognosis for individuals on disability retirement. An 18-year mortality follow-up study of 6887 men and women sampled from the general population. *BMC Public Health* 2006;6:103.
- 30 Gjesdal S, Ringdal PR, Haug K, et al. Mortality after long-term sickness absence: prospective cohort study. *Eur J Public Health* 2008;18:517–21.
- 31 Henrekson M, Persson M. The effects on sick leave of changes in the sickness insurance system. *J Lab Econ* 2004;22:87–113.
- 32 Skogman T.P. Reporting sick: are sporting events contagious? *J Appl Econ* 2004;19:809–23.
- 33 Holmlund B. *Sickness Absence, Search Unemployment and Social Insurance*. Department for economics, Uppsala University. 2004.
- 34 Hytti H. Why are Swedes sick but Finns unemployed? *Int J Soc Welfare* 2006;15:131–41.
- 35 Larsson L. Sick of being unemployed? Interactions between unemployment and sickness insurance. *Scand J Econ* 2006;108:97–113.
- 36 Gregg P, Tominey E. The wage scar from male youth unemployment. *Labour Econ* 2005;12:487–509.