Extended abstract

Cause-specific mortality among unemployed in Finland in 1996-2007

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Introduction

Research from different countries and different periods has shown that mortality is higher in the unemployed population than in people at work (Moser, Fox et al. 1984; Iversen, Andersen et al. 1987; Stefansson 1991; Martikainen and Valkonen 1996; Pensola and Notkola 2010). It has been shown that this association between unemployment and elevated mortality is related to the experience of unemployment and related factors that have a direct effect on the risk of death (Moser, Fox et al. 1984; Morris, Cook et al. 1994; Mathers and Schofield 1998). Some of the factors at play are related both to the risk of unemployment and the risk of death; one example is poor health. Furthermore, these factors may be related not only to job loss, but also to the duration of unemployment (Stewart 2001). Prolonged unemployment has been found to increase mortality even years after the unemployment episode (Jin, Shah et al. 1995; Martikainen and Valkonen 1996; Pensola 2003). The excess mortality found among the unemployed is likely attributable not only to personal characteristics such as age, sex, education and social class, but to macro and meso level factors as well. For instance, the relationship between unemployment and mortality is bound to be affected by macro-economic factors, such as the national unemployment rate and economic growth, and at the meso level by the occupational unemployment rate (Iversen, Andersen et al. 1987; Martikainen and Valkonen 1996; Julkunen 2001).

At the first decade of the 21st century the unemployment rate has been 8-9%, except for the end of the year 2007 when it declined to 6%. . In 2000 and 2008 the long-term unemployment rate was 2.8% and 1.2%, respectively. The proportion of long-term unemployment of the jobless population was in 2000 28.2% and in 2008 18.4%.

Aims of the study

Because of the high overall level of unemployment and the large number of long-term unemployed, it is important to study the mortality of unemployed persons in Finland. The aims of this study were to:

- Compare mortality among the unemployed with that of the whole labour force
- Find out how the length of the unemployment period is related to mortality in all causes of death and in alcohol-related deaths
- Find out the contribution of education, income and marital status to mortality differences differences by duration of unemployment

Data and method

Data

The dataset for this analysis consists of longitudinal data from censuses and different registries. It covers all Finnish persons in the labour force who at the end of 2000 were aged 25-64. Death records by cause of death for 2001-2007 were linked to the data by means of personal identification numbers.

The number of person years for unemployed men was 953 512 and for unemployed women 946 969. The number of all deaths was 10 982 and 3 396 respectively.

Measurement

Information on labour force status is based on the situation at the end of 2000 and the duration of the unemployment from years 1998–2000.

The causes of death are classified according to Tenth Revision of the International Classification of Diseases (STAKES 1999). We analysed all-cause mortality and alcohol-related mortality including alcohol as a contributory cause (F10, G312, G4051, G621, G721, I426, K292, K70, K860, K8600/K852, O354, X45).

Our list of covariates includes labour force status, length of unemployment, education, income quintiles and marital status (married/at consensual union, divorced or widowed, single)

Statistical analyses

In order to control for the effects of differences in the age structures by cause-specific mortality, directly age-standardized death rates (SDR) was calculated. Poisson regression models were used to estimate the adjusted relative mortality rates and their 95% confidence intervals. We used different reference population for females and males. This is because the mortality rate of males is higher than that of females. In the unemployed population male mortality is three times as high as in females. Reference population for unemployment is the labour force (unemployed and employed) in 2000.

Results

Death rate was higher for unemployed men and women compared to all men and women in the labour force. All-cause deaths increased by age with exception of unemployed aged 55–59 years. Alcohol related deaths among unemployed men and women increased to age group 45–50 and then they decline.

Unemployment was divided by its duration to three groups: less than 12 months unemployment during 1997-99 (19% of men and 27% of women), 12-23 months unemployment (31% of men and 36% of women) and 24-36 months unemployment (50% of men and 38% of women).

The proportion of alcohol-related deaths was 50% for unemployed men and 34% for unemployed women: for the employed these figures were 28% and 12%, respectively. Unemployment was related to excess all-cause mortality (for men RR 3.51 (3.43-3.59) and for women 2.23 (2.15-2.33)), and particularly for alcohol-related mortality (for men RR 6.92 (6.67-7.19 and for women 7.18 (6.60-7.80)). The duration of unemployment increased the risk of death in alcohol-related causes. In comparison to employed men (women) the RR of those unemployed less than one year was 3.3 (1.07), RR of those unemployed 12-23.5 months was 4.3 (4.29) and of those unemployed more than 24 months 9.6 (12.62). Approximately 50% of the excess mortality of the unemployed persons regardless of the length of unemployment could be accounted for by their excess mortality for alcohol-related causes.

Figure 1 Age-specific death rate for all-cause and alcohol related deaths among men and women aged 24-64

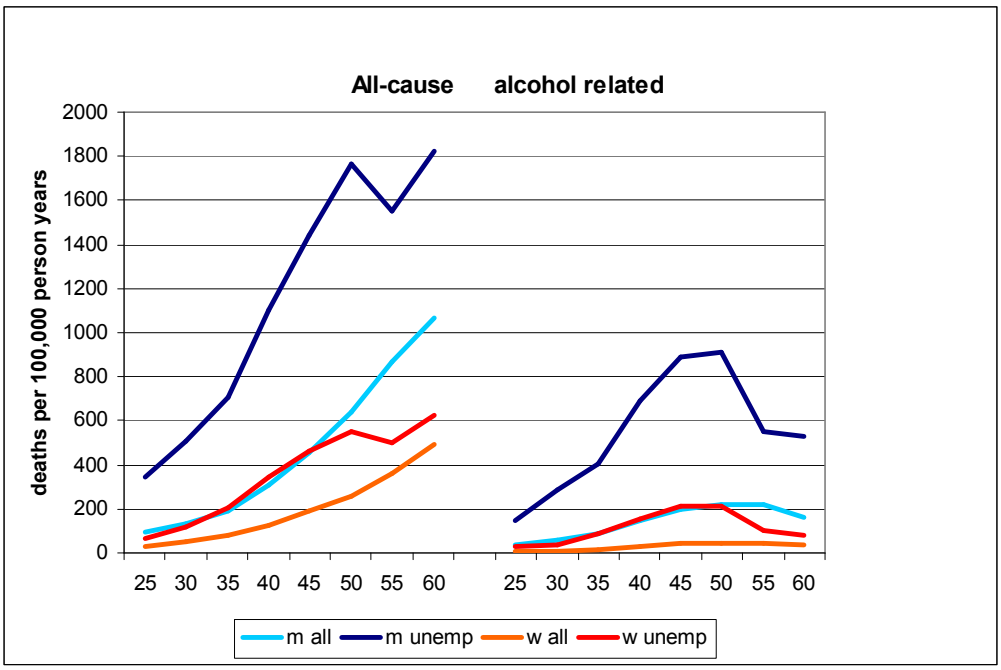

Table 1 All-cause and alcohol-related mortality (relative rates and 95% confidence intervals) by employment status, men and women aged 25-64 in 2001-2007

	Men				Women			
	All-causes		**Alcohol-related**		**All-causes**		**Alcohol-related**	
	RR	**CI**	**RR**	**CI**	**RR**	**CI**	**RR**	**CI**
Employed	1.00		1.00		1.00		1.00	
Unemployed	**3.51**	(3.43–3.60)	**6.92**	(6.67-7.19)	**2.24**	(2.15–2.33)	**7.18**	(6.60-7.80)
Employed	1.00		1.00		1.00		1.00	
Unemployed								
- less than 12 months	**2.10**	(1.98–2.24)	**3.44**	(3.13–3.78)	**1.39**	(1.26–1.53)	**2.94**	(2.40–3.60)
- 13–35.5 months	**2.55**	(2.44–2.67)	**4.35**	(4.07–4.65)	**1.78**	(1.66–1.91)	**4.27**	(3.71–4.90)
- 24 + months	**4.48**	(4.37–4.61)	**9.60**	(9.22–10.01)	**2.96**	(2.82–3.11)	**12.53**	(11.40–13.73)

Among the unemployed, education explained only 5% among men and 10% among women of the relationship between unemployment duration and mortality. Among men, income explained two thirds of the relationship between unemployment duration and mortality. The difference between the relative rate among men with 1-12 months and 12-23,5 months unemployment was due to differences in income between these groups. Among women only 10% of the excess mortality of those unemployed less than 24 months could be attributed to their incomes but 40% of those unemployed more than 24 months. Marital status mediated one third of this relationship among men and 10-15% among women. After simultaneous adjustment for these indicators, RR of men unemployed 24+ months reduced by 76% and of women by 50% in comparison to those unemployed less than a year.

Conclusions: unemployment is related to the excess mortality both among men and women. The excess increased by the length of the unemployment. Approximately half of the excess can be attributed to the alcohol-related causes regardless of the length of the unemployment. Both among men and women a substantial proportion of the excess can be attributed to the incomes and less so to marital status. In these data the effect of education was only minor.

Table 2 All-cause mortality (relative rates) by the duration of unemployment among 25-64-year-old unemployed men and women in 2001-2007

	Men					**Women**				
	Model1	Model2	Model3	Model4	Model5	Model1	Mode2	Model3	Model4	Model5
Duration of unemployment										
1-12 months	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12-23,5 months	**1.24**	**1.23**	**1.10**	**1.16**	1.07	**1.28**	**1.26**	1.10	**1.17**	1.06
24+ months	**2.29**	**2.21**	**1.41**	**1.85**	**1.31**	**2.88**	**2.80**	**1.58**	**2.20**	**1.43**
Education										
Upper level tertiary		1.00			1.00		1.00			1.00
Lowest level tertiary		1.11			1.11		1.12			1.12
Upper secondary		**1.39**			**1.28**		**1.48**			**1.35**
Basic, missing		**1.57**			**1.41**		**1.57**			**1.39**
Income quintiles										
Highest			1.00		1.00			1.00		1.00
2			**1.21**		**1.16**			**1.18**		1.12
3			**1.59**		**1.37**			**1.72**		**1.42**
4			**2.56**		**1.97**			**3.18**		**2.31**
Lowest			**2.83**		**2.26**			**3.45**		**2.64**
Marital Status										
Married /cohabited				1.00	1.00				1.00	1.00
Divorced/widowed				**2.38**	**2.10**				**3.31**	**2.86**
Single				**2.06**	**1.80**				**2.50**	**2.13**

Model 1: Adjusted for age and duration of unemployment
Model 2: Adjusted for age, duration of unemployment and education
Model 3: Adjusted for age, duration of unemployment and income
Model 4: Adjusted for age, duration of unemployment and marital status
Model 5: Adjusted for age, duration of unemployment, education, income and marital status

Table 3 Alcohol-related mortality (relative rates) by the duration of unemployment among 25-64-year-old unemployed men and women in 2001-2007

	Men					**Women**				
Alcohol-related	Model1	Model2	Model3	Model4	Model5	Model1	Mode2	Model3	Model4	Model5
Duration of unemployment										
1-12 months	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12-23,5 months	**1.28**	**1.26**	1.10	**1.17**	1.06	**1.50**	**1.45**	**1.50**	**1.45**	**1.42**
24+ months	**2.88**	**2.80**	**1.58**	**2.20**	**1.43**	**4.84**	**4.45**	**3.21**	**4.28**	**2.75**
Education										
Upper level tertiary		1.00			1.00		1.00			1.00
Lowest level tertiary		1.12			1.12		1.08			1.20
Upper secondary		**1.48**			**1.35**		1.43			**1.45**
Basic, missing		**1.57**			**1.39**		**1.89**			**1.78**
Income quintiles										
Highest			1.00		1.00			1.00		1.00
2			**1.18**		1.12			0.97		1.00
3			**1.72**		**1.42**			1.12		1.13
4			**3.18**		**2.31**			**2.45**		**2.25**
Lowest			**3.45**		**2.64**			**3.43**		**3.29**
Marital Status										
Married /cohabited				1.00	1.00				1.00	1.00
Divorced/widowed				**3.31**	**2.86**				**2.13**	**2.03**
Single				**2.50**	**2.13**				**1.60**	**1.51**

Model 1- model 5: see table 2.

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