

## SUBSTANCE ABUSE

# Unemployment, cigarette smoking, alcohol consumption and body weight in young British men

SCOTT M. MONTGOMERY, DEREK G. COOK, MEL J. BARTLEY, MICHAEL E.J. WADSWORTH \*

The relationship of unemployment experienced between the ages of 16 and 33 years with smoking, alcohol consumption and obesity was examined in 2,887 men who were members of the 1958 longitudinal British birth cohort study (NCDS). Cigarette smoking, alcohol consumption, measured as units consumed in the past week and as problem drinking using the CAGE questionnaire and the body mass index (BMI) were measured at age 33 years. Both the amount of unemployment accumulated between the ages of 16 and 33 years and recent unemployment experienced in the year prior to interview at age 33 years were examined. When compared with men who had never been unemployed, the adjusted relative odds amongst men with over three years of accumulated unemployment (after adjustment for possible confounding socioeconomic and behavioural factors measured prior to unemployment) were 2.11 (95% CI: 1.42-3.12) for smoking, 2.13 (95% CI: 1.32-3.42) for a low BMI and non-significant for a high BMI; 1.52 (95% CI: 1.04-2.24) for no alcohol consumed; non-significant for high alcohol consumption, but 2.15 (95% CI: 1.39-3.33) for problem drinking. Men who had experienced unemployment in the year prior to the interview, compared to those who had not, after adjustment, were significantly more likely to smoke (RO 2.92, 95% CI: 2.13-4.01), drink heavily (RO 1.73, 95% CI: 1.18-2.54) and to have a drink problem (RO 2.90, 95% CI: 1.99-4.21). Unemployment may play a significant part in establishing life-long patterns of hazardous behaviour in young men.

Key words: alcohol, body mass index, cigarette smoking, unemployment

Excess morbidity<sup>1-4</sup> and mortality<sup>5-7</sup> have both been convincingly associated with unemployment. One explanation for this association, described as the selection hypothesis, is that poorer health or health behaviour itself increases the risk of unemployment.<sup>8-12</sup> A second explanation is that the experience of unemployment may be damaging to health,<sup>13</sup> possibly because job loss is a stressful life event<sup>14-18</sup> and unemployment can result in relative material hardship<sup>19</sup> and social exclusion.<sup>20</sup> It has also been suggested that the experience of unemployment is associated with hazardous health behaviours and weight gain.<sup>21</sup> There is some debate as to whether the hazardous health behaviours pre-date the unemployment or are consequences of experiencing unemployment.<sup>22</sup> A deterioration in health behaviours has been reported in

young men,<sup>23</sup> but this change has not been observed as clearly in older men.<sup>21</sup>

We have examined the relationship between unemployment, cigarette smoking, alcohol consumption and body mass index (BMI) (which can be partly considered as an outcome of various health behaviours) in men from a national longitudinal birth cohort study at age 33 years. In this study of young British men we are able to consider a period when behaviour patterns were being established in a cohort subject to relatively high unemployment levels soon after labour market entry. Because of the longitudinal nature of this study we have been able to examine the role of selection in explaining the association of poor health and health behaviour with unemployment. By controlling for socioeconomic background, educational attainment and health behaviours which predated labour market entry (and were thus not influenced by any previous experience of unemployment) at age 16 years, we were able to assess changes in these factors after the experience of unemployment. We were also able to examine both the cumulative effect of unemployment and the effect of recent unemployment.

Table 1 illustrates the timing of the measurements of socioeconomic circumstances, BMI and health behaviours. It also indicates the unemployment rate amongst men in this cohort between 1974 when they were aged 16

\* S.M. Montgomery<sup>1</sup>, D.G. Cook<sup>2</sup>, M.J. Bartley<sup>3</sup>, M.E.J. Wadsworth<sup>4</sup>

<sup>1</sup> University Department of Medicine, Royal Free Hospital School of Medicine, London, UK

<sup>2</sup> Department of Public Health Sciences, St. George's Hospital Medical School, London, UK

<sup>3</sup> Department of Epidemiology and Public Health, University College London Medical School, UK4 MRC National Survey of Health and Development, University College London Medical School, UK

Correspondence: Dr S.M. Montgomery, University Department of Medicine, Royal Free Hospital School of Medicine, Rowland Hill Street, London NW3 2PF, UK, tel. +44 171 8302465, fax +44 171 8302465

years and 1991 when they were aged 33 years,<sup>24</sup> clearly showing the effect of the economic recession of the early 1980s.

This paper is limited to men only, as unemployment in women is difficult to interpret during these child-bearing years: many women reported 'child or home care' as their main activity during a period of non-employment, even though they would have accepted a job if one were offered. It was felt that the definition of unemployment used for men would not be appropriate for many women. Men and women should also be treated separately as there is evidence that their reactions to unemployment are significantly different in terms of their health behaviour.<sup>25</sup>

## METHODS

These data are from the National Child Development Study (NCDS),<sup>26-29</sup> an ongoing national longitudinal study of those living in Great Britain who were born between 3 and 9 March 1958. There have been six data collection sweeps: at birth and at ages 7, 11, 16, 23 and 33 years. The study has its origins in the Perinatal Mortality Survey (PMS) which collected data about the births of 17,414 infants to parents in Great Britain, representing 98% of births in the target week. For the PMS, midwives completed questionnaires and information was also taken from medical records. The sweeps conducted at ages 7, 11 and 16 years collected information from parents, who were interviewed by health visitors, from class teachers, who completed questionnaires and from medical examinations conducted by school health services. The cohort members completed ability tests and at age 16 years filled in a self-completion questionnaire. At ages 23 and 33 years data collection included interviews carried out by professional survey research interviewers and cohort members also filled in self-completion questionnaires.

The target sample at age 33 years was 16,455 and a total of 86% of the target was traced. There were 11,407 cohort members interviewed in 1991 at age 33 years, 69% of the target population. The cohort has remained largely representative although the most disadvantaged groups may be under-represented.<sup>27-30</sup> An investigation of non-responses has indicated that the systematic loss to follow-up of the most disadvantaged men has resulted in a conser-

vative estimate of the prevalence of unemployment and hazardous health behaviours at age 33 years and possibly a conservative estimate of the association between unemployment and these behaviours. When NCDS men were born, overall 10% of them had parents in social class V. In the analyses performed here, only 6.7% of the men were born with their parents in social class V. Because of the known association between parental social class and unemployment in young men,<sup>31</sup> this indicates some loss of men with a higher risk of unemployment.

A total of 5,588 men were interviewed at age 33 years, but, as cases with missing data were excluded, between 2,444 and 2,887 men were used for these analyses. The distribution of unemployment in the group of men used for these analyses was similar to that observed in the larger group of 5,588 men: 6.5% of the men had experienced over three years of accumulated unemployment, between the first labour market entry and age 33 years, amongst the 5,588 men, while 5.4% had over three years of unemployment amongst the smaller group. Because missing data resulted in the exclusion of a significant number of men from the analyses, the effect of their exclusion on the univariate relationships of unemployment with the health behaviours is reported.

### *Unemployment*

Unemployment was defined as being out of employment and seeking work. A full history of unemployment experience was collected at ages 23 and 33 years covering the period 1974-1991 (ages 16-33 years). As the unemployment history was collected at two points in time, as well as an employment history, it was possible to validate and combine the unemployment histories collected at both time points. Two unemployment variables were used in these analyses. The first comprised the total number of months of unemployment between the ages of 16 and 33 years, grouped into four categories: no unemployment and 1-12, 13-36 and over 36 months of unemployment. The second variable identified recent unemployment and was defined as unemployment experienced during the year prior to the interview at age 33 years. An analysis of recall bias revealed that spells of unemployment with a duration of less than three months were poorly remembered. Unemployment periods of less than three consecutive months were not included in the analyses used here, as these short spells tended only to be reported if they occurred at a time immediately prior to an interview.

### *Cigarette smoking*

Men were classified as smokers or non-smokers at age 33 years based on a self-report at age 33 years of the number of cigarettes smoked per day. For the earlier measure of smoking behaviour cohort members prospectively reported the number of cigarettes they smoked per week at age 16 years.

### *Alcohol consumption*

The measures of alcohol consumption were based on the number of units consumed during the week prior to the

**Table 1** Unemployment rates between the ages of 16 (1974) and 33 years (1991) amongst men in the National Child Development Study (n=4,999) and measures used in the analyses

Year	Proportion unemployed %	Measures
1974-1976	12.5	Age 16 years: social class of parents, height, weight, drinking and cigarette smoking behaviour
1977-1979	15.9	
1980-1982	20.2	
1983-1985	12.1	
1986-1988	9.1	
1989-1991	9.1	Age 33 years: height, weight, drinking and cigarette smoking behaviour

interview at ages 16 and 33 years, as reported to the interviewer. A unit was equivalent to half a pint of beer, a single measure of spirits or a glass of wine. The indicators for alcohol consumption used were no alcohol consumed in the previous week and the top fifth of the alcohol consumption distribution. The standard CAGE questionnaire<sup>32</sup> items were used to identify those who had a drink problem (three or more positive responses to the CAGE questionnaire). This questionnaire uses a series of questions (which were modified for British use) including the four which provide its name: 'Have you ever felt that you should *cut down* on your drinking?', 'Have people *annoyed* you by criticizing your drinking?', 'Have you ever felt bad or *guilty* about your drinking?', 'Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hang over (*eye-opener*)?'. The instrument, used in this way, has been validated as an indicator of drinking problems.<sup>32</sup>

### BMI

The BMI at ages 16 and 33 years was used as an index of relative weight. The BMI was calculated as weight (kg) divided by height (m<sup>2</sup>). Heights and weights were measured without shoes. At age 16 years heights and weights were measured by a school medical officer. At age 33 years heights and weights were measured by professional research interviewers using stadiometers and electronic scales.

### Social class

The Registrar General's social class based on the father's occupation when the cohort member was 16 years of age was used. Where the father was not present, the mother's social class was used. The Registrar General's social class has been described as measuring levels of prestige<sup>33</sup> or skill.<sup>34</sup> This measure of social class is divided into six ordinal categories (I, II, III non-manual, III manual, IV and V). Class I represents the highest level of prestige or skill and class V the lowest.

### Qualifications and age at leaving full-time education

Qualifications were grouped into 6 ordinal categories indicating the highest qualification achieved: no qualifications, low-level qualifications, 'O' level or equivalent qualifications, 'A' level or equivalent qualifications, other higher qualifications below university level and university degrees and higher or equivalent qualifications. The age at leaving full-time education was divided into three groups: left at age 16 years or before, left at age 17 to 18 years and left at age 19 years or older.

### Region

The place of residence at age 16 years was used to indicate the region. Great Britain was divided into 11 regions.<sup>31</sup>

### Statistical analysis

All the analyses were conducted using SPSS.<sup>35</sup> The relationships of cigarette smoking, alcohol consumption and the BMI at ages 16 and 33 years with the amount of

unemployment experienced and recent unemployment at age 33 years were examined by cross tabulation and logistic regression. Rather than using mean values, separate low and high measures of alcohol consumption and the BMI were analysed, as unemployment may be associated with both extremes of the distributions. Separate multiple logistic regression models were used to investigate the health behaviour and BMI outcome measures at age 33 years, while adjusting for confounding variables. Categorical variables were entered into the logistic models as binary dummies.

In order to model changes in a variable, such as a high BMI, between the ages of 16 and 33 years, the variable at age 33 years was modelled as the dependent variable. A detailed measure of the same behaviour or BMI at age 16 years was included in the model as an explanatory variable, thus adjusting for the effect of selection. Such an approach is often referred to as conditional change modelling, as it conditions on initial state by including it as an explanatory variable.<sup>36</sup> This approach is appropriate where marked changes in distribution are taking place between the two time points.

## RESULTS

Table 2 shows the distribution of unemployment and its relationship to the potential confounding variables. Overall, 59.0% reported no unemployment while 5.8%

Table 2 Accumulated unemployment between the ages of 16 and 33 years by parental social class, age at leaving full-time education, highest qualification attained and unemployment in the previous 12 months at age 33 years

	n	Months unemployed			
		0 %	1-12 %	13-36 %	≥37 %
Parental social class					
I and II	810	64.3	24.1	8.8	2.8
III non-manual	310	61.3	24.8	10.3	3.5
III manual	1,247	58.5	22.8	12.5	6.3
IV	415	53.3	22.2	14.9	9.6
V	105	40.0	33.3	12.4	14.3
Age at leaving full time education (years)					
16	1,790	59.5	20.4	12.3	7.8
17-18	504	61.1	26.2	10.3	2.4
≥19	593	55.6	31.4	10.3	2.7
Highest qualification					
None	239	39.7	23.4	17.2	19.7
Some	284	53.5	23.6	12.0	10.9
'O' level	732	59.6	21.4	13.0	6.0
'A' level	757	62.7	23.0	11.1	3.2
Professional	429	68.3	21.7	7.5	2.6
Degree	446	56.5	30.5	10.8	2.2
Unemployed in last year					
No	2,721	62.6	22.9	10.6	3.9
Yes	166	0.0	36.1	27.7	36.1
All	2,887	59.0	23.7	11.6	5.8

had more than three years of accumulated unemployment between the ages of 16 and 33 years. Of all the men 5.7% had experienced unemployment in the year prior to the interview at age 33 years. Larger amounts of accumulated unemployment were associated with a lower social class at age 16 years and lower levels of education.

**Smoking**

At age 16 years, men who subsequently experienced more than three years of unemployment were already more likely to smoke (50.0%), than those who experienced no unemployment, of whom 31.6% were smokers (table 3). By age 33 years this difference had grown to 51.2% of men who had accumulated over three years of unemployment compared with 25.8% smoking amongst those who had never been unemployed, reflecting the greater tendency for men who experience less unemployment to stop smoking. The recently unemployed were also more likely to smoke at age 33 years than those who had not been recently unemployed (53.9 and 28.6% respectively). After adjustment for confounding variables, including the number of cigarettes smoked per week at age 16 years, the relative odds of smoking at age 33 years were 2.11 (95% CI: 1.27–3.50) in the group with more than three years of unemployment. Smoking at age 33 years was also associated with recent unemployment (adjusted RO 2.06, 95% CI: 1.41–3.03). Including both accumulated and recent

unemployment in the same model suggested that both were independently associated with smoking at age 33 years.

A univariate analysis (n=5,242) to assess the effect of excluding cases with missing data indicated that the relationship between unemployment and cigarette smoking at age 33 years may have been somewhat underestimated: 55.6% of men who accumulated over three years of unemployment and 54.1% of recently unemployed men were smokers.

**BMI**

Table 3 shows that the proportion of men in the bottom fifth of the BMI distribution (maximum BMI value 22.62, median 21.44) was greatest amongst those who experienced over three years of unemployment, both at age 16 years and at age 33 years when the association was stronger (25.2 and 30.5% respectively). At age 33 years the adjusted relative odds for being in the bottom fifth of the BMI distribution for men with over three years of unemployment were 2.13 (95% CI: 1.32–3.42). Interestingly, the adjustment for confounders, including the BMI at age 16 years, did not reduce the relative odds. This implies that the experience of over three years of unemployment was associated with a fall in the BMI ranking between the ages of 16 and 33 years and this was confirmed in more detailed analysis (data not shown). There

**Table 3** Smoking and body mass index (BMI top and bottom fifths of the distribution) by amount of unemployment between ages 16 and 33 years, and recent unemployment

	Smoking						Low BMI						High BMI					
			Age (years)					Age (years)					Age (years)					
	n	16 %	33 %	unadj RO	adj RO <sup>a</sup>	adj RO <sup>b</sup>	n	16 %	33 %	unadj RO	adj RO <sup>a</sup>	adj RO <sup>b</sup>	n	16 %	33 %	unadj RO	adj RO <sup>a</sup>	adj RO <sup>b</sup>
<b>Unemployment (months)</b>																		
0	1,689	31.6	25.8	1.00	1.00	1.00	1,455	19.3	18.2	1.00	1.00	1.00	1,455	20.1	19.5	1.00	1.00	1.00
1–12	679	32.4	30.6	1.27 (1.04–1.55)	1.30 (1.03–1.64)	1.24 (0.98–1.57)	565	18.2	20.5	1.16 (0.91–1.48)	1.24 (0.94–1.63)	1.24 (0.94–1.64)	565	20.5	17.5	0.87 (0.68–1.13)	0.80 (0.60–1.08)	0.80 (0.59–1.07)
13–36	330	42.1	40.3	1.95 (1.52–2.49)	1.67 (1.25–2.24)	1.57 (1.17–2.12)	293	24.2	19.1	1.06 (0.77–1.46)	1.02 (0.71–1.47)	1.02 (0.70–1.48)	293	21.2	19.5	0.99 (0.73–1.37)	0.94 (0.65–1.35)	0.92 (0.63–1.34)
≥37	166	50.0	51.2	3.03 (2.19–4.18)	2.11 (1.42–3.12)	1.79 (1.18–2.73)	131	25.2	30.5	1.97 (1.33–2.93)	2.13 (1.32–3.42)	2.11 (1.27–3.50)	131	20.6	23.7	1.28 (0.84–1.95)	1.18 (0.71–1.95)	1.14 (0.67–1.94)
<b>Unemployment in last year</b>																		
No	2,699	32.8	28.6	1.00	1.00	1.00	2,308	19.9	19.2	1.00	1.00	1.00	2,308	20.4	19.2	1.00	1.00	1.00
Yes	165	54.5	53.9	2.92 (2.13–4.01)	2.06 (1.41–3.03)	1.57 (1.04–2.38)	136	21.3	25.0	1.40 (0.94–2.10)	1.32 (0.83–2.10)	1.02 (0.62–1.69)	136	20.6	21.3	1.14 (0.75–1.75)	1.10 (0.66–1.82)	1.12 (0.65–1.92)
<b>Total n</b>	<b>2,864</b>						<b>2,444</b>						<b>2,444</b>					

The odds are shown with 95% confidence intervals. Adjusted for social class, qualifications, age at leaving full-time education, region and number of cigarettes smoked at age 16 years. The models for the BMI at age 33 years were also adjusted for the BMI at age 16 years and the number of cigarettes smoked per day at age 33 years.

a: Accumulated and recent unemployment modelled separately  
 b: Accumulated and recent unemployment adjusted for each other  
 unadj RO: unadjusted RO; adj RO: adjusted RO

was no clear evidence that unemployment of less than three years was associated with a low BMI at age 33 years, nor was there any clear evidence that a low BMI was associated with recent unemployment.

After adjustment for confounding variables, including the BMI at age 16 years, neither measure of unemployment was associated with a high BMI (minimum BMI value 28.14, median 30.07) at age 33 years.

A univariate analysis (n=5,177) to assess the effect of excluding cases with missing data indicated that the relationship between unemployment and the BMI at age 33 years may have somewhat underestimated the association of unemployment with a high BMI. Twenty-six percent of men who had accumulated over three years of unemployment and 22.4% of recently unemployed men had a high BMI. In men who had accumulated over three years of unemployment and in recently unemployed men, 26.8 and 24.8% respectively, had a low BMI.

*Alcohol consumption*

Men who went on to experience over three years of unemployment were more likely to have drunk no alcohol in the week prior to the interview at age 16 years (58.7%), compared with men who would experience no unemployment (47.4%), as shown by table 4. At age 33 years abstinence was also more common amongst those with over three years of unemployment (28.7%) than those who had never been unemployed (17.9%). After adjust-

ment for confounding variables including drinking at age 16 years, the relative odds of not drinking at age 33 years were 1.52 (95% CI: 1.04–2.24) in men with over three years of unemployment. There was no suggestion that smaller amounts of accumulated unemployment or recent unemployment were related to abstinence.

A high alcohol consumption at age 16 years was not related to subsequent experience of unemployment (table 4). A high alcohol consumption at age 33 years (top fifth of the distribution, minimum 31 units, median 44.00) was more common amongst those with over three years of unemployment (adjusted relative odds 1.47, 95% CI: 0.97–2.23) and significantly associated with recent unemployment (adjusted relative odds 1.73, 95% CI: 1.18–2.54). The inclusion of both accumulated and recent unemployment in the same model confirmed that recent unemployment was more clearly related to a higher alcohol consumption.

A univariate analysis (n=5,249) to assess the effect of excluding cases with missing data indicated that the relationship between unemployment and alcohol consumption at age 33 years may have somewhat underestimated the association of no alcohol consumption in the week prior to the interview and unemployment. Of men who had accumulated over three years of unemployment and recently unemployed men 34.1 and 26.6% respectively, had no alcohol in the week prior to interview at age 33 years. Of men who had accumulated over three

**Table 4** Alcohol consumption in the previous week (no alcohol and the top fifth of the distribution) by amount of unemployment between the ages of 16 and 33 years and recent unemployment

	No alcohol						High alcohol						Problem drinking					
			Age (years)					Age (years)					Age (years)					
	n	%	16	33	33	n	%	33	33	33	n	%	33	33	33			
			RO	adj RO <sup>a</sup>	adj RO <sup>b</sup>			RO	adj RO <sup>a</sup>	adj RO <sup>b</sup>			RO	adj RO <sup>a</sup>	adj RO <sup>b</sup>			
<b>Unemployment (months)</b>																		
0	1,703	47.4	17.9	1.00	1.00	1.00	1,703	5.7	14.6	1.00	1.00	1.00	1,703	10.5	1.00	1.00	1.00	
1–12	683	46.7	17.9	1.00	1.02	1.00	683	7.3	16.7	1.17	1.13	1.07	683	16.0	1.62	1.63	1.50	
				(0.79–1.26)	(0.81–1.30)	(0.78–1.27)				(0.92–1.49)	(0.89–1.43)	(0.83–1.38)			(1.25–2.10)	(1.25–2.13)	(1.14–1.96)	
13–36	334	53.6	19.2	1.09	1.01	0.98	334	5.7	16.5	1.15	1.08	1.57	334	17.4	1.79	1.86	1.62	
				(0.81–1.47)	(0.74–1.38)	(0.71–1.34)				(0.84–1.58)	(0.78–1.51)	(0.71–1.34)			(1.19–2.70)	(1.33–2.59)	(1.14–2.28)	
≥37	167	58.7	28.7	1.86	1.52	1.40	167	4.8	21.6	1.60	1.47	1.22	167	19.8	2.10	2.15	1.57	
				(1.30–2.65)	(1.04–2.24)	(0.93–2.11)				(1.08–2.38)	(0.97–2.23)	(0.77–1.92)			(1.39–3.16)	(1.39–3.33)	(0.97–2.53)	
<b>Unemployment in last year</b>																		
No	2,721	48.7	18.2	1.00	1.00	1.00	2,721	6.0	15.2	1.00	1.00	1.00	2,721	12.2	1.00	1.00	1.00	
Yes	166	47.6	25.3	1.52	1.14	1.27	166	6.0	24.7	1.83	1.73	1.62	166	27.7	2.75	2.90	2.26	
				(1.06–2.18)	(0.97–2.05)	(0.84–1.92)				(1.27–2.65)	(1.18–2.54)	(1.06–2.46)			(1.92–3.93)	(1.99–4.21)	(1.50–3.40)	
<b>Total n</b>	<b>2,887</b>						<b>2,887</b>						<b>2,887</b>					

The odds are shown with 95% confidence intervals. Adjusted for social class, qualifications, age at leaving full-time education, region and number of units of alcohol consumed in the week prior to interview at age 16 years.

a: Accumulated and recent unemployment modelled separately

b: Accumulated and recent unemployment adjusted for each other  
unadj RO: unadjusted RO; adj RO: adjusted RO

years of unemployment and recently employed men 18.2 and 22.0% respectively, were in the top alcohol consumption group.

Problem drinking, as identified by the CAGE questionnaire, was more prevalent amongst those who experienced unemployment, with a slight positive gradient with the increasing amount of accumulated unemployment (table 4). Recent unemployment was particularly strongly associated with problem drinking, the relative odds after adjustment for confounding variables being 2.90 (95% CI: 1.99–4.21). Interestingly, accumulated unemployment remained significantly associated with problem drinking even after adjustment for recent unemployment, which was clearly more strongly associated with problem drinking, with adjusted relative odds of 2.26 (95% CI: 1.50–3.40).

A univariate analysis ( $n=5,248$ ) to assess the effect of excluding cases with missing data indicated that the relationship between unemployment and problem drinking at age 33 years may have been somewhat overestimated. Of men who had accumulated over three years of unemployment and recently unemployed men 17.9 and 26.6% respectively, had drinking problems at age 33 years.

## DISCUSSION

Whilst we found evidence of selection into unemployment for those with a worse health behaviour, we also observed that the experience of unemployment resulted in a further deterioration of health behaviours. Unlike other studies, we have adjusted for the potential confounding effects of socioeconomic background factors as well as relevant measures of behaviour prior to labour market entry. Men who left full-time education at the earliest age were at risk of experiencing more unemployment than those who remained in education for longer. However, this was not the reason for the association between the outcome measures and unemployment, as the adjustment for the age at leaving full-time education did not significantly alter our findings (data not shown).

Men who experienced unemployment were more likely to smoke, have a low BMI, and consume less alcohol at age 16 years. However, even after adjustment for behaviour at age 16 years and the other potential confounding factors, we have observed significant associations of body weight and a deterioration of health behaviour with recent and accumulated unemployment at age 33 years. While a relatively small proportion of our sample had experienced recent unemployment at age 33 years (5.7%) or over three years of unemployment since labour market entry (5.8%), this is probably a conservative estimate in population terms, as the most disadvantaged men (who are at greater risk of unemployment) are more likely to have been lost from the NCDS.<sup>27–30</sup>

Youth unemployment has been associated with a deterioration in health behaviours, including smoking,<sup>37</sup> and the men in this study who had accumulated more unemployment were less likely to give up cigarette smoking and slightly more likely to have taken it up. Both accumulated

and recent unemployment were associated with a higher rate of cigarette smoking independently of each other.

Neither recent unemployment nor the amount of unemployment were significantly associated with a high BMI. This is not too surprising, as no social class gradient for obesity in men between the ages of 16 and 44 years was observed in the 1993 Health Survey for England.<sup>38</sup> The non-significant relationship between a higher BMI and greater amounts of unemployment may indicate the beginning of a tendency to obesity amongst long-term unemployed men in middle age, as observed in the Regional Heart Study.<sup>21</sup> The relatively high prevalence of a low BMI amongst men who had been unemployed was unexpected and the circumstances surrounding this phenomenon deserve further investigation. Smoking is known to be associated with a low BMI, but as we adjusted for this, it is unlikely to explain the relationship between a low BMI and unemployment. A combination of behavioural and other factors, including heavy drinking, may be responsible for the relationship. Further analysis indicated that the association between low weight and accumulated unemployment was partly due to weight loss between age 23 and 33 years (data not shown), but it was not possible to determine if this occurred at a time of unemployment.

Both a high alcohol consumption and a high CAGE score were significantly associated with recent unemployment. The risk of having a high CAGE score increased with the accumulation of unemployment. One explanation for this is that men with a drink problem find it harder to obtain and keep a job because of the drinking problem itself. Exposure to unemployment may also cause or exacerbate a drinking problem.

Both recent and accumulated unemployment are likely to have resulted in a greater risk of financial hardship and this may have a direct effect on health and health behaviour. Unemployment in Britain in the late 1980s onwards has been associated with multiple deprivation and social polarization,<sup>39</sup> indicating that any experience of unemployment is associated with a significant risk of continuing financial hardship. Because a low income is associated with previous unemployment<sup>40</sup> as well as current unemployment, more work to investigate the mediating role of financial hardship in the relationship of unemployment with health and health behaviours is desirable.

We have found that both recent and accumulated unemployment are associated with deterioration of health behaviours, but were unable to look at the potentially damaging effects of anticipating job loss,<sup>41</sup> which may also account for some deterioration in health and health behaviour amongst men who suffer labour market disadvantage. While unemployment may have an acute effect, previous studies have shown that mental well-being amongst the unemployed may improve in those who are satisfactorily employed,<sup>18,42–44</sup> and this may also have positive consequences for health behaviour. However, whether such a resolution is likely to take place in men who have a drinking problem is unclear.

## CONCLUSION

Despite evidence that the health behaviour of men who would go on to experience unemployment was already different prior to labour market entry, unemployment appeared to have further chronic and acute effects on health behaviour. As this is a study of young men, for whom patterns of health behaviour were still being established, it provides evidence that unemployment may play a significant part in establishing life-long patterns of hazardous behaviour in terms of alcohol consumption and cigarette smoking.

This paper forms part of a project funded by the British Economic and Social Research Council Grant No. R000234697.

Thanks are due to the Staff of the Social Statistics Research Unit, City University, who provided the data used here. We are grateful to Oli Harris for his perseverance in retyping the tables.

## REFERENCES

- 1 Cook DG, Cummins RO, Bartley MJ, Shaper AG. Health of unemployed middle aged men in Great Britain. *Lancet* 1982;ii:1290-4.
- 2 Daniel WW, Stilgoe E. Where are they now? A follow up study of the unemployed. *Political Econ Plan*, 1979.
- 3 Moylan S, Davies R. The disadvantages of the unemployed. *Employment Gazette* 1980;88:830-2.
- 4 Moylan S, Millar J, Davies R. For richer, for poorer: DHSS cohort study of unemployed men. London: HMSO, 1984.
- 5 Moser KA, Fox AJ, Jones DR. Unemployment and mortality in the OPCS longitudinal study. *Lancet* 1984;ii:1324-8.
- 6 Moser KA, Goldblatt PO, Fox AJ, Jones DR. Unemployment and mortality: comparison of the 1971 and 1981 longitudinal study samples. *BMJ* 1987;294:86-90.
- 7 Morris JK, Cook DG, Shaper AG. Loss of employment and mortality. *BMJ* 1994;308:1135-9.
- 8 Cook DG. A critical view of the unemployment and health debate. *Statistician* 1985;34:73-82.
- 9 Wagstaff A. Unemployment and health: some pitfalls for the unwary. *Hlth Trends* 1986;18:79-81.
- 10 Wadsworth MEJ. In: Wilkinson RG, editor. *Class and health*. Cambridge: Tavistock 1986:50-74.
- 11 Robinson N, Yateman NA, Protopapa LE, Bush L. Unemployment and diabetes. *Diabetic Med* 1989;6:797-803.
- 12 Clausen B, Bjorndal A, Hjort PF. Health and re-employment in a two year follow-up of long term unemployed. *J Epidemiol Commun Hlth* 1993;47:14-8.
- 13 Smith R. *Unemployment and health: a disaster and a challenge*. Oxford: Oxford University Press, 1987.
- 14 Jahoda M. The impact of unemployment in the 1930s and the 1970s. *Bull Br Psychol Soc* 1979;32:309-14.
- 15 Warr PB. Job loss, unemployment and psychological well-being. In: Allen V, Van de Vliert E, editors. *Role transitions*. New York: Plenum Press, 1984.
- 16 Warr PB. *Work, unemployment and mental health*. Oxford: Oxford University Press, 1987.
- 17 Isakson K. Unemployment and mental health and the psychological function of work in male welfare clients in Stockholm. *Scand J Soc Med* 1989;17:165-9.
- 18 Banks MH, and Jackson PR. Unemployment and the risk of minor psychiatric disorder in young people: cross-sectional and longitudinal evidence. *Psychol Med* 1982;12:189-98.
- 19 White M. *Against unemployment*. London: Policy Studies Institute, 1991.
- 20 Whelan CT. The role of income, life-style deprivation and financial strain in mediating the impact of unemployment on psychological distress: evidence from the Republic of Ireland. *J Occupat Organizat Psychol* 1992;65:331-4.
- 21 Morris JK, Cook DG, Shaper AG. Non-employment and changes in smoking, drinking and body weight. *BMJ* 1992;304:536-41.
- 22 Bartley MJ. Unemployment and ill health: understanding the relationship. *J Epidemiol Commun Hlth* 1994;48:333-7.
- 23 Hammarström A, Janlert U, Theorell T. Youth unemployment and ill health: results from a 2-year follow-up study. *Soc Sci Med* 1988;26:1025-33.
- 24 Montgomery SM. *The relationship of unemployment with health and health behaviour in young men (dissertation)*. The City University, London.
- 25 Lahelma E, Kangas R, Manderbacka K. Drinking and unemployment: contrasting patterns among men and women. *Drug Alcohol Depend* 1995;37:71-82.
- 26 Shepherd P. *The National Child Development Study: an introduction to the background to the study and the methods of data collection*. London: NCDS Working Paper No 1, Social Statistics Research Unit, City University, 1985.
- 27 Ferri E, editor. *Life at 33*. London: National Children's Bureau, 1993.
- 28 Butler NR, Bonham, DG. *Perinatal mortality*. Edinburgh: Livingstone, 1963.
- 29 Butler NR, Alberman ED, editors. *Perinatal problems*. Edinburgh: Livingstone, 1969.
- 30 Power C, Manor O, Fox AJ. *Health and class: the early years*. London: Chapman and Hall, 1991.
- 31 Montgomery SM, Bartley MJ, Cook DG, Wadsworth MEJ. Health and social precursors of unemployment in young men in Great Britain. *J Epidemiol Commun Hlth* 1996;50:415-22.
- 32 Liskow B, Campbell J, Nickel EJ, Powel BJ. Validity of the CAGE questionnaire in screening for alcohol dependence in a walk-in (triage) clinic. *J Studies Alcohol* 1995;36(3):277-81.
- 33 Office of Population Censuses and Surveys. *Classification of occupations*. London: HMSO, 1970.
- 34 Office of Population Censuses and Surveys. *Classification of occupations*. London: HMSO, 1980.
- 35 Norusis M. *SPSS user's guide*. Chicago: SPSS Inc., 1990.
- 36 Plewis I. *Analysing change*. London: Wiley, 1985.
- 37 Hammarstrom A. Health consequences of unemployment. *Public Hlth* 1994;108:403-12.
- 38 Bennet N, Dodd T, Flatley J, Freeth S, Bolling K. *The health survey for England 1993*. London: HMSO, 1995.
- 39 Lee P, Townsend P. A study of inequality, low incomes and unemployment in London, 1985-92. *Int Labour Rev* 1994;133:579-95.
- 40 Gregg P, Wadsworth J. A short history of labour turnover, job tenure and job security, 1975-93. *Oxford Rev Econ Policy* 1995;11(1):73-90.
- 41 Ferrie JE, Shipley MJ, Marmot MG, Stansfeld S, Davey Smith G. Health effects of anticipation of job change and non-employment: longitudinal data from the Whitehall II study. *BMJ* 1995;311:1264-9.
- 42 Corti L. For better or worse? Annual change in smoking, self-assessed health and subjective well-being. In: Buck N, Gershuny J, Rose D, Scott J, editors. *Changing households*. Manchester: ESRC Research Centre on Micro-Social Change, 1994.
- 43 Ross CE, Mirowsky J. Does employment affect health? *J Hlth Soc Behav* 1995;36:230-43.
- 44 Tiggeman M, Winefield AH. The effects of unemployment on mood, self-esteem, locus of control and depressive effect on school leavers. *J Occupat Psychol* 1984;57:33-42.

Received 6 June 1996, accepted 5 November 1996