Health effects of unemployment

Wirral Performance & Public Health Intelligence Team

(H, Moller, 2011)

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Unemployment and Health

The negative health effects of unemployment have been studied extensively and unemployment has been linked with increased mortality (Lundin et al. 2010; Zagozdzon et al 2008; Ahs and Westerling 2006; Gerdtham and Johannesson 2003; Morris et al. 1994; Stefanson 1991; Martikainen 1990; Iversen 1989; Iversen et al. 1987; Moser et al 1984), worse mental health status (Paul and Moser 2009; McKee-Ryan et al. 2005), higher morbidity and long term illness (Bartley and Plewis 2002; Arber and Lahelma 1993) and increased exposure to lifestyle related risk factors (Montgomery et al. 1999; Lee et al 1991). Other studies have also investigated health service use among the unemployed (Yuen et al. 1989) and the effectiveness of interventions to mediate the adverse health effects of the unemployed (Harris and Harris 2009). The negative effects of unemployment have also been shown to affect the family and wider community (Moser et al. 1986; Novo et al. 2001; Solantaus et al. 2004).

The relationship between unemployment and negative health outcomes is complex as each individual will experience unemployment differently and a number of factors such as education, socio economic status, gender, age, social and family support, the health system and state support may be interacting with the effects that unemployment will have on health (Paul and Moser 2009) (figure 2). There has been some debate on whether unemployment is caused by ill health or unemployment causes ill health. Studies have shown that both are the case (Bartley 1996**)**. A number of models have been established explaining the relationship between unemployment and health (Janlert and Hammarström 2009) and a recent study showed that the model of latent functions[1] by Johoda (1982) might be best suited to explain the negative health effects of unemployment (Janlert and Hammarström 2009).

To assess the impact of changes in (un)employment status upon health, the different aspects from cause to effect should be taken into consideration. To outline their interaction the DPSSEA (Driving force, Pressure, State, Exposure, Effect, Action) model (Corvalan et al. 1996), developed by the World Health Organisation (WHO), can be used (figure 1). The DPSEEA model originated from an environmental health context to describe health problems from their root causes to the possible health effects to help identify areas for intervention at the different levels. Ideally interventions should tackle the root causes of unemployment. However at a local level action should also be taken to mediate the negative health effects of unemployment as much as possible.

[1] These latent functions include giving the day a time structure, providing opportunities for social contact with other people, contributing to status and personal identity for the individual and providing an opportunity to strive towards collective purposes and shared experience (Janlert and Hammarström 2009)

The influence of the different factors in relation to unemployment on health and their interaction are illustrated in figure 2. Unemployment has been linked with worse mental health, increased morbidity and increased mortality. The link between unemployment and risk factors is unclear (figure 2). The different factors are interrelated and may in turn also influence unemployment. The effect of unemployment may be mediated or increased by a range of individual factors and societal factors such as age, sex, socio-economic status, ethnicity, minority/majority status, duration of unemployment, social cohesion of society, health system, unemployment protection, welfare system and labour market opportunities. Unemployment has also been found to negatively influence the health of other family members, and family support has been found to mediate the negative effects of unemployment. (Paul and Moser 2009).

Figure 1: Driving Force, Pressure, State, Exposure, Effect, Action Model for unemployment and health after Corvalan et al. (1996).

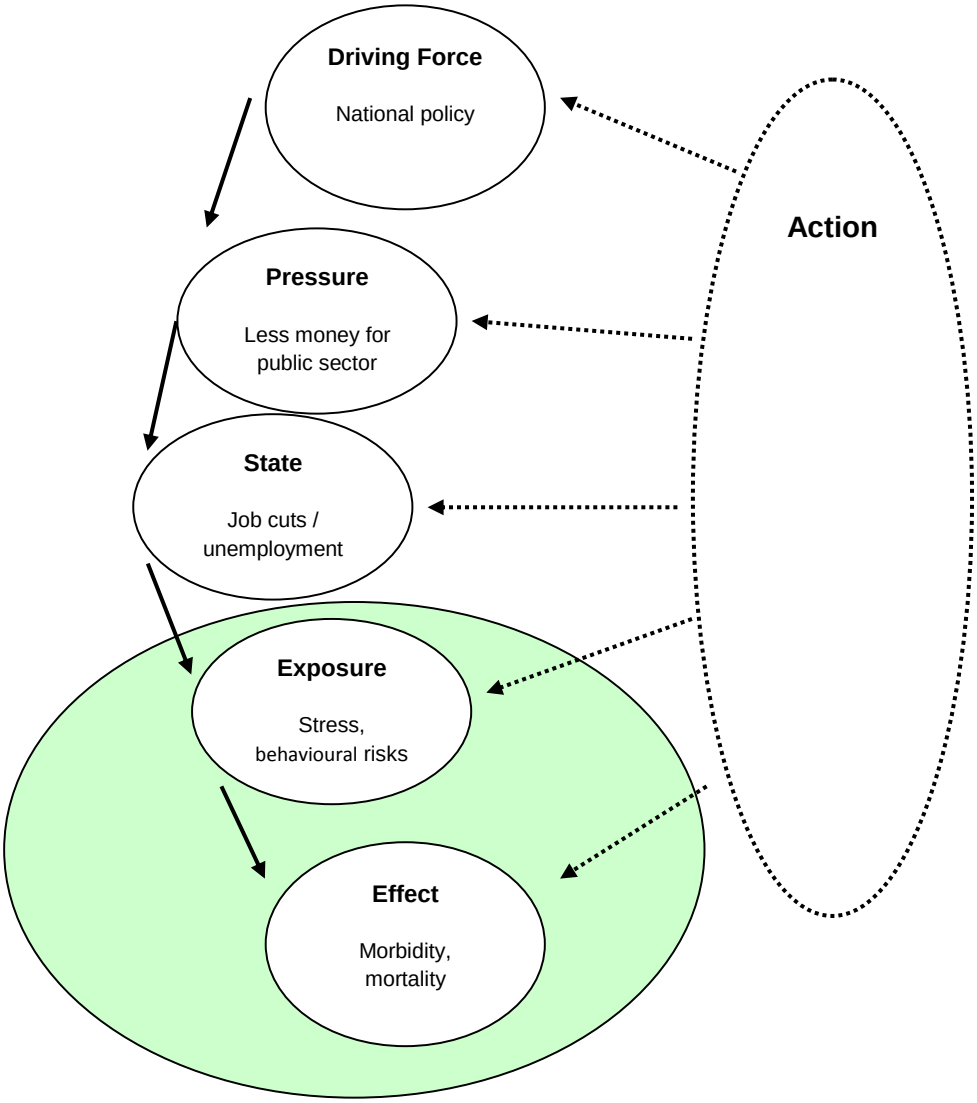
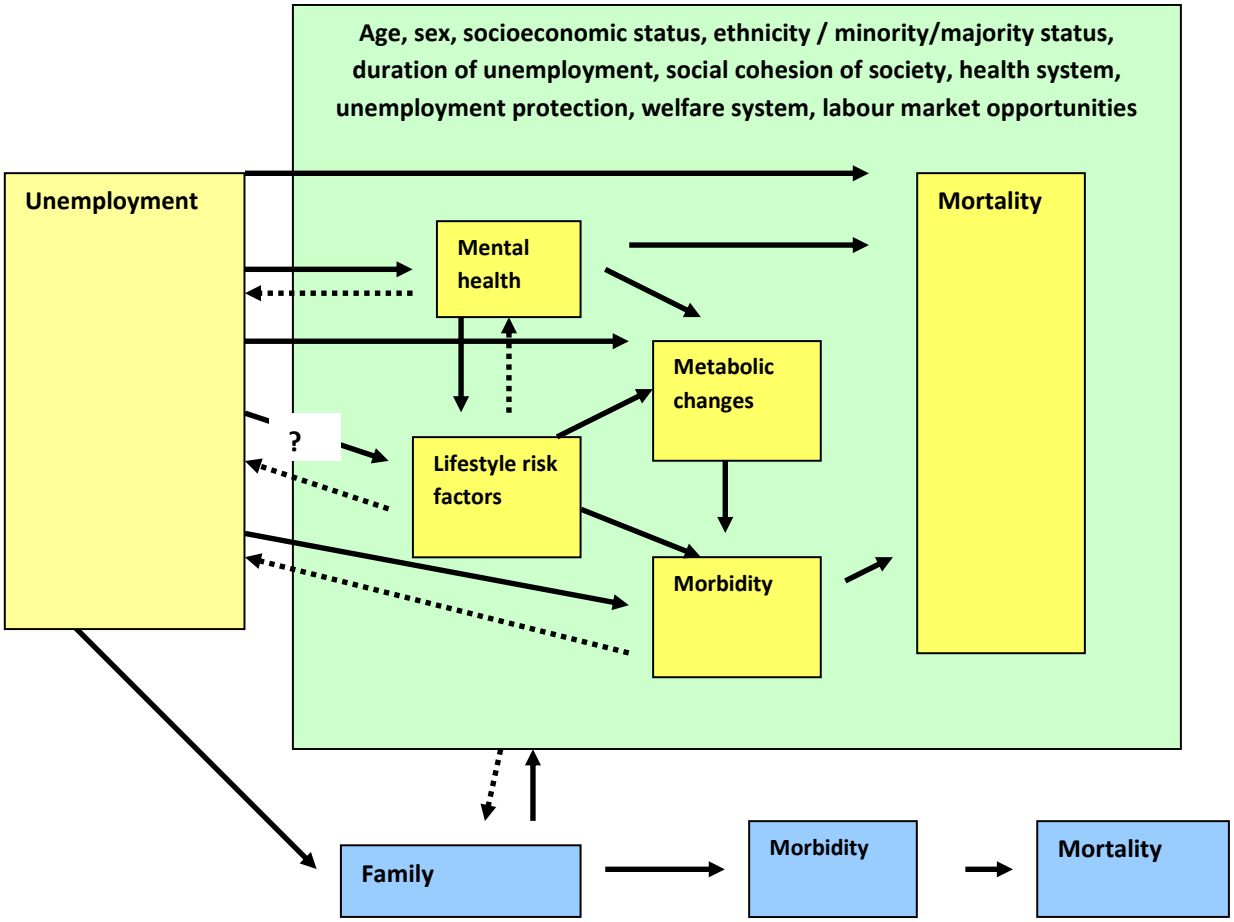


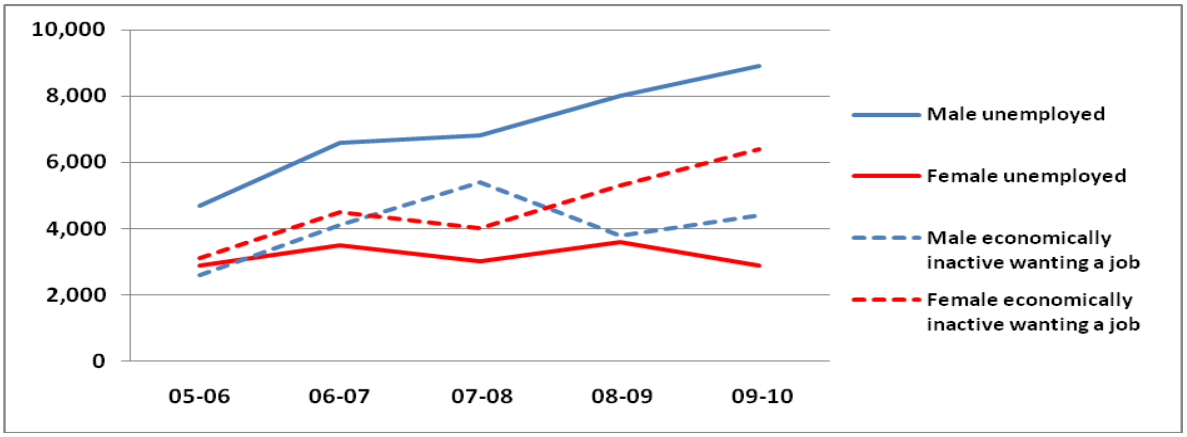
Figure 2: Unemployment and health, mechanisms and mediating factors.



Unemployment in Wirral

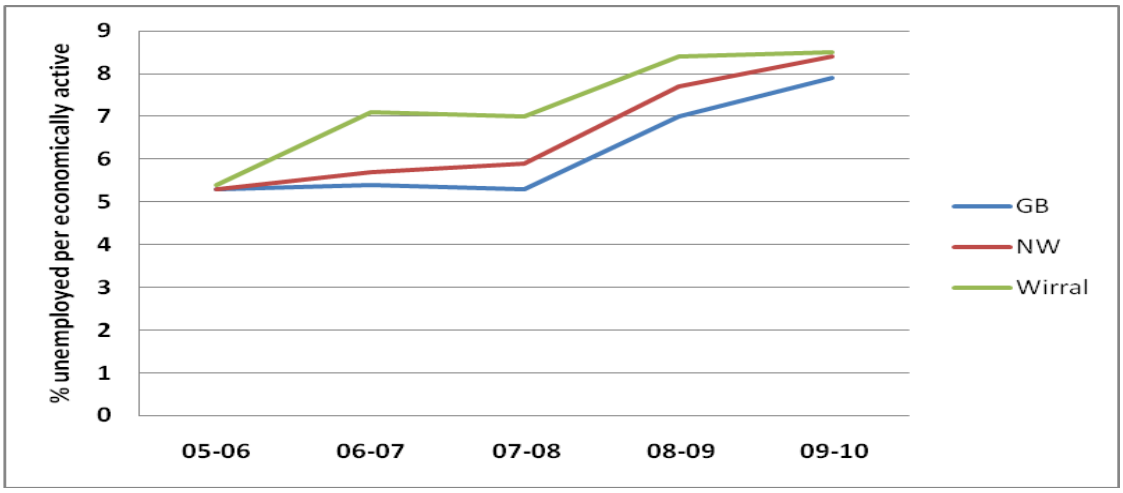
From July 2009 till June 2010 11,800 people (8900 men and 2900 women) were unemployed in Wirral. This is 9.6% of men and 3% of women of the whole population aged 16-64 and 12.3% and 4.3% of economically active men and women respectively. Of those, economically inactive, 4,400 (4.8%) men and 6,400 (6.5%) women wanted a job (ONS 2011) (figure 3, table A1). From 2005/06 to 2009/10 unemployment increased steadily in men by 89.4% and fluctuated in women showing no change between 2005/06 to 2009/10. Over the same time period, the number of economically inactive men and women who are looking for a job increased by 106.5% and 69.2% respectively (table A1).

Figure 3: Number of male and female unemployed and those economically inactive wanting a job in Wirral 05-06 to 09-10, (ONS 2011).



Compared to Great Britain and the North West, unemployment rates were highest in Wirral throughout the whole time period (figure 4). The gap between Wirral, the North West and Great Britain decreased in the last two years, due to unemployment rates in females in Wirral decreasing, while rates kept increasing in the North West and Great Britain. In 2009-10 female unemployment rates (4.3%) were 2.3% below the North West and Great Britain (6.3%). In comparison male rates (12.3%) were 3.4% above those in Great Britain and 2.4% higher than in the North West (table A2).

Figure 4: Unemployment rates (percentage of economically active population) in Wirral, North West and Great Britain 05-06 to 09-10, (ONS 2011).



Quantifying the impact of increased unemployment in Wirral

In the following, we review and use the evidence from established studies to quantify the impact of increased unemployment on mortality, mental health and long term limiting illness (LLTI) in Wirral.

Mortality related to unemployment

Several longitudinal studies from the 1980s and 1990s provided strong evidence for a causal relationship between unemployment and increased mortality, linking unemployment with a number of different diseases (Moser et al. 1984; Iversen et al.1987; Iversen 1989; Martikainen 1990, Stefanson 1991; Morris et al. 1994).

However the evidence for some diseases is conflicting and some of the positive associations found in earlier studies may have been due to confounding of individual risk factors. A recent Swedish study, which controlled for 12 confounders (Lundin et al. 2010) and a study from Finland, which investigated the health effects of unemployment in times of generally high unemployment and thus decreasing selection bias among the unemployed (Martikainen and Valkonen 1996), only found weak associations between unemployment and increased mortality.

Despite the uncertainties around some of the disease areas the Swedish study by Lundin et al. (2010) still found a positive association between unemployment and all cause mortality (57% increase in the unemployed), violent death (116% increase in the unemployed), suicide (76% increase in the unemployed) and violent death other than suicide (346% increase in the unemployed) after adjusting for 12 competing risk factors.

Other diseases which have been linked with unemployment in previous studies, which did not control for such a large amount of confounders, are cancers, cardiovascular diseases, diseases of the liver, diseases of the digestive system, symptoms not elsewhere classified, alcohol related causes and accidents and infections.

While it seems implausible that diseases with long lag times such as cancers are linked to short term unemployment more research is required to investigate the relationship between unemployment and some of the other disease areas.

Study selection

The literature review identified 11 longitudinal studies (table 1) quantifying the impact of unemployment on mortality. These studies combined unemployment data with mortality data and to a varying degree with data on the individual level to control for confounding. The number of confounding variables included in the analysis ranged from one to twelve. Where data was provided for different time periods, we decided to choose the shorter time period, as we are primarily interested in the direct impacts of unemployment. Most studies provided outcomes for different diseases; we restricted our analysis to all cause mortality in the first instance.

Table 1: Studies on unemployment and mortality, relative risk ratios for all cause mortality.

Author	Cohort	Time period	Confounders included	RR	LCI	UCI
Lundin et al. (2010)	49321 Swedish men born 1949-51	unemployed 1992-94 mortality 1995-2003	adjusted for 12 competing risk factors: Crowded housing 1960, parental class 1960, risk use of alcohol 1969, smoking 1969, psychiatric diagnosis 1969, emotional control 1969, contact with police 1969, psychiatric diagnosis 1973-91, education 1990, socio-economic position 1990, income 1990-91, insured sickness absence 1990-91	1.57	1.13	2.15
Zagozdzon et al. (2008)	24127 Polish men 20-65	1999-2004 unemployed and mortality 1999-2004	age adjusted	2.12	1.96	2.28
	23120 Polish women 20-60	1999-2004 unemployed and mortality 1999-2004	age adjusted	1.64	1.41	1.89
Ahs and Westerling (2006)	cohort of 44407 men and women aged 18-64, of these 986 women and 1081 men were unemployed	period of low (1984-89) and high unemployment (1992-97) combined; mortality up to 2000	adjusted for 8 competing risks: age, gender, country of birth, level of unemployment, education, cohabitating status, region of residence and longstanding illness	1.43	1.03	1.98
Voss et al (2004)	18020 Swedish twin men born between 1926 and 1958	unemployment 1973, mortality 10 year follow up	adjusted for 7 competing risk factors: age, marital status, smoking status, alcohol consumption, use of sleeping pills, unstable personality and long lasting/ serious illness	1.5	1	2.2
	18516 Swedish twin women born between 1926 and 1958	unemployment 1973, mortality 10 year follow up	adjusted for 7 competing risk factors: age, marital status, smoking status, alcohol consumption, use of tranquilizers, extroverted personality and long lasting/ serious illness	1.4	0.7	3
Gerdtham and Johanneson (2003)	27994 Swedish men and women aged 20-64	survey 1980-86, mortality followed up till 1996	Adjusted for 9 competing risk factors: geography, annual income, age (at the inclusion in the study), gender, immigration, education, marital status, the number of children and initial health status.	1.46	no CIs	

Author	Cohort	Time period	Confounders included	RR	LCI	UCI
Morris et al. (1994)	6191 British men aged 40-59 of these 923 were unemployed	screening 1978-1980 and five year follow up	adjusted for 6 competing risk factors: age, town, social class, smoking, alcohol and pre existing disease	1.95	1.57	2.43
Martikainen (1990)	Finnish men 30-54 covering 2.677 mio person years	1980 census and 1981-1985 mortality	adjusted for 6 competing risks: age, socioeconomic status, education, marital status, reimbursable medicines and sick allowance days	1.93	1.82	2.05
Iversen et al. (1987)	Danish men 20-64	unemployed 1970 mortality 1970-1975	adjusted for age and 4 competing risk factors in separate analyses for each risk factor: age, occupation, geographical region, marital status, housing category	1.44-1.57	1.37-1.50	1.51-1.65
	Danish women 20-64	unemployed 1970 mortality 1970-1975	adjusted for age and 4 competing risk factors in separate analyses for each risk factor: age, occupation, geographical region, marital status, housing category	1.46-1.57	1.30-1.39	1.65-1.77
Moser et al. (1987)	men 15-64 age at death	census 1971 deaths 1973	age and social class	1.3	0.91	1.77
	men 15-64 age at death	census 1971 deaths 1974-1981	age and social class	1.45	1.27	1.64
	men 15-64 age at death	1981 census deaths in 1983	Age and social class?	1.47	1.18	1.8
Coster and Segnan 1987	13462 Italian men 15-54	census 1981, mortality 1981-85	Adjusted for 5 competing risks: age, tenure, region of birth, education, marital status. The study does not differentiate between sick leave and unemployment at date of census	2.02	1.79	2.27
Stefanson (1986)	men 16-64, total n=28896	long term unemployed in 1980- 1983, mortality 1980-1986	adjusted for age	1.37	1.22	1.53
	women 16-64, total n=28896	long term unemployed in 1980- 1983, mortality 1980-1986	adjusted for age	1.14	0.91	1.42
Moser (1984)	men 15-64 age at death	census 1971 deaths 1971-1981	Adjusted for age and social class	1.21	1.08	1.35

Calculations

Current mortality due to unemployment was calculated using the formula for the population attributable fraction:

$$PAF = \frac{\sum_{i=1}^{n} P_i(RR_i - 1)}{\sum_{i=1}^{n} P_i(RR_i - 1) + 1}$$

Where
P_i = current exposure level for category i and
RR_i=Relative risk of mortality for exposure category i

The expected excess mortality due to increased unemployment was calculated using the formula for the potential impact fraction, defining the increased level of unemployment as a counterfactual scenario (Murray et al. 2003).

$$PIF = \frac{\sum_{i=1}^{n} P_i \quad RR_i - \sum_{i=1}^{n} P_i' \quad RR_i}{\sum_{i=1}^{n} P_i \quad RR_i}$$

P_i = current exposure level for category i,
RR_i=Relative risk of mortality for exposure category i and
P'_i = counterfactual exposure level for category i

Exposure data on current unemployment was taken from the office for national statistics (ONS), labour market statistics (ONS 2011). Counterfactual scenarios were defined as a 1% increase in unemployment. Relative risk ratios were for the different scenarios were taken from the studies described in table 1 and mortality data for Wirral PCT for 2007-09 were obtained from ONS.

The current number of deaths due to unemployment and the expected increase were calculated using the relative risks from the study by Lundin et al (2010), which is the most recent study and controlled for the largest number of confounders. We also carried out a sensitivity analysis using: the mean RR of all studies, the lowest and highest RR of all studies as well as the 95% confidence interval limits of the study by

Lundin et al. (2010). Calculations were carried out for two exposure scenarios: a.) percentage of unemployed of working age population and b.) Percentage of unemployed plus those wanting a job of working age population.

Results

From July 2009 till June 2010, 9.6% of men and 3% of women of the population aged 16-64 were unemployed in Wirral. Additionally 4.8% of economically inactive men and 6.5% of economically inactive women, who were not registered as unemployed, wanted a job (ONS 2011).

Based on the findings by Lundin et al. (2010), current levels of unemployment might cause around 23.3 deaths (19.1 men and 4.2 women) per year. Assuming that those wanting a job, but currently not registered as unemployed might be at the same risk as the unemployed around 39.2 deaths (27.8 men and 11.4 women) might be due to unemployment in Wirral per year. The different scenarios in table 2 show the impact of using different studies and RRs for the calculation and the possible range of the number of deaths.

Based on the study by Lundin et al. (2009), a 1% increase in unemployment would result in 3.14 (1.24 in women and 1.9 in men) extra death per year.

Table 2: Estimated annual number of deaths attributable to current unemployment, Wirral 2007-09, per 16-64 year olds.

			attributable deaths		
exposed	**model**	**RR**	**men**	**women**	**both**
Unemployed	**Lundin et al. (2009)**	**1.57**	**19.1**	**4.2**	**23.3**
	mean of all studies	1.68	22.5	5.0	27.5
	lowest RR by sex	1.14 women; 1.21 men	7.3	1.1	8.3
	highest RR by sex	1.64 women; 2.12 men	35.6	4.7	40.4
	Lundin lower 95% CI	1.13	4.5	1.0	5.5
	Lundin upper 95% CI	2.18	37.4	8.6	45.9
Unemployed plus those wanting a job	**Lundin et al. (2009)**	**1.57**	**27.8**	**11.4**	**39.2**
	mean of all studies	1.68	32.6	13.5	46.1
	lowest RR by sex	1.14 women; 1.21 men	10.7	2.9	13.7
	highest RR by sex	1.64 women; 2.12 men	50.8	12.8	63.6
	Lundin lower 95% CI	1.13	6.7	2.7	9.4
	Lundin upper 95% CI	2.18	53.1	22.4	75.6

Morbidity

Unemployment has been linked with limiting long term illness (LLTI) (Bartley and Plewis 2001), mental health problems (Paul and Moser 2009; McKee Ryan et al. 2005, Comino et al. 2003, Murphy and Athanasou 1999) and a number of studies suggest a positive association between unemployment and heart disease (Mattiason et al 1990, Iversen et al. 1989, Cook et al. 1982, Janlert et al. 1992 and Hammerstrom et al 1994).

Heart disease

In a review of ten studies on unemployment and heart disease Weber and Lehnert (1997) concluded the evidence to be inconclusive, despite the fact that all studies showed a positive association. This was based on the fact that the results were largely non-significant and the design of the ten studies was insufficient to show a causal relationship. Some of the mortality studies discussed above also investigated the associations between unemployment and mortality from heart disease (table A1). Martikainnen (1990), Iversen et al. (1987), Morris et al. (1994) and Zagozdzon (2008)[2] reported statistically significant results at the 95% confidence interval limit for cardiovascular diseases with mortality being 35% to 80% higher in the unemployed. Lundin et al. (2010) and Voss et al. (2004) found positive but statistically non significant associations ranging from 7 to 30%. Moser et al. (1984 and 1987) reported non-significant and significant values for the unemployed for IHD (7-82%) and circulatory diseases (9-59%) for different time periods (table A3).

Limiting long term illness and mental health problems

LLTI and mental health problems are somewhat overlapping as LLTI may also include mental health problems. However LLTI is much broader and the leading three causes of LLTI in the UK in 2002 were musculoskeletal (33.7%), heart and circulatory (19.3%) and respiratory diseases (10.4%) (Table A4)

Limiting long term illness

In their analysis of English census data from 1971 to1991, Bartley and Plewis (2001) reported a positive association between unemployment and LLTI and likewise social class and LLTI. The age adjusted risk for people who were unemployed in 1981 was 1.94 times greater in 1991 to suffer from LLTI compared to those who were employed in 1981. Class was found to have an even greater association with LLTI

[2] Male and female combined

with the lowest class experiencing double the risk compared to those who did not report disadvantaged class.

Mental health

Several studies have shown a link between unemployment and mental health problems (Paul and Moser 2009; McKee Ryan et al. 2005, Comino et al. 2003, Murphy and Athanasou 1999). A recent meta analysis by Paul and Moser (2009) found a positive association between unemployment and overall mental health, mixed symptoms, depression, anxiety, psychosomatic symptoms, subjective well being and self esteem. The association was of medium size for all these variables except for psychosomatic symptoms where it was small. Age, sex and duration of unemployment were found to be highly significant moderator variables. The results of this meta analysis indicate a 2.125 fold increase in the number of persons with psychological problems with potential clinical severity in the unemployed (Paul and Moser 2010).

Calculations:

The results of the studies by Bartley and Plewis (2001) and Paul and Moser (2010) were used to calculate:
a.) the number of people with LLTI and mental health problems due to current levels of unemployment and unemployment plus those wanting a job and
b.) the increase in LLTI and mental health problems among the unemployed for each 1% increase in unemployment level measured per population aged 16-64.

Current levels of LLTI and mental health problems among the unemployed (*N*) were calculated using the formula $N = P_e * RR_u * N_u$
(Where P_e is the percentage of people with LLTI or mental health problems in the reference population, RR the increased risk in the unemployed and N_u the number of unemployed).

The number of excess cases among the unemployed was derived by subtracting the number of cases if rates were equal to those in the employed from the expected (*N*) number in the unemployed $N – (P_e * N_u)$

UK prevalence data for the age groups 16-64, by 5 year age bands for LLTI was taken from the 2001 census (ONS 2006) and for mental health problems from the mental health survey for the UK by Singleton et al. (2001). The data was adjusted to local population by five year age bands and the average percentage of mental health problems in those of working age was calculated. It needs to be noted that these prevalence estimates are for the whole population and therefore do not distinguish

between the employed and unemployed. Consequently it will overestimate the prevalence in the reference population slightly.

The increased risk of LLTI and mental health problems in the unemployed was calculated by multiplying the prevalence values with the increased risks in the unemployed of 1.94 and 2.125 respectively.

Results

Limiting long term illness

After adjusting UK data to local population, the prevalence of LLTI was estimated to be 15.4% in Wirral among all 16-64 year olds (15.5% in men and 15.3% in women) and 29.4% in the unemployed. Among those currently unemployed in Wirral, 3494 people might suffer LLTI and about 1665 of these cases might be attributable to unemployment (table 3). Assuming that those wanting a job, but not officially registered as unemployed are at the same risk of LLTI as the unemployed 6666 people in this group might suffer from LLTI and 3176 of these cases might be due to not having a job (table 3). A 1% increase in unemployment might result in 267 extra cases of LLTI (129 men and 138 women).

Table 3: Estimated number of unemployed people suffering from LLTI in Wirral.

	Men	Women	Total
unemployed total	2613.4	880.9	3494.3
unemployed excess	1245.1	419.7	1664.8
unemployed and those wanting a job total	3905.5	2760.3	6665.8
unemployed and those wanting a job excess	1860.7	1315.1	3175.8

Mental health problems

The prevalence of mental health problems for all age groups is estimated to be around 20.3% in the North West (25.2% in women and 15.4% in men) (Singleton et al. 2001) and around 17% in the 16-64 year olds in Wirral (14.2% in men and 19.9% women) after adjusting to local population Among the currently unemployed, 3962 people might suffer mental health problems and about 2097 cases might be attributable to unemployment (table 4). Assuming that those wanting a job, but not registered as unemployed, have the same level of mental health problems as the unemployed, the number of people with mental health problems in this group would be 8009 of which 4240 might be attributable to unemployment. A one percent

increase in unemployment would result in 370 extra cases of people with mental health problems (148 men and 222 women).

Table 4: Estimated number of unemployed people suffering from mental health problems in Wirral.

	Men	Women	Total
unemployed total	2687.0	1274.5	3961.5
unemployed excess	1422.5	674.7	2097.2
unemployed and those wanting a job total	4015.5	3993.4	8008.9
unemployed and those wanting a job excess	2125.8	2114.2	4240.0

Summary and conclusion

Current levels of unemployment may cause around 23 deaths per year and may be attributable for 2392 cases of mental health problems and 1664 cases of LLTI in Wirral. **Each 1% increase in unemployment would result in extra 3 deaths, 267 cases of LLTI and 370 people suffering from mental health problems.** Assuming that those wanting a job, but not classified as unemployed are at the same risk as the unemployed, around 39 deaths per year and 4240 cases of mental health problems and 3176 cases of LLTI would be attributable to the current levels of unemployment. With a number of studies reporting an association between heart disease and unemployment, albeit not statistically significant, there is also a likely to be an increase in the amount of people suffering from heart diseases with increased unemployment. In addition to the outcomes included in our analysis unemployment might also be associated with other negative health outcomes where the evidence is not sufficient to date.

Using data from a Swedish study in our main model of the mortality analysis might result in conservative estimates as the impact of unemployment may be greater in England and the North West, where the state support for the unemployed is less pronounced compared to Sweden. This is supported by a recent study which correlated mortality data with employment data for 26 European Union countries (Stuckler et al. 2009). This study found a positive association between unemployment and suicide, homicide and alcohol abuse for all countries combined, but a negative association for Sweden and Finland. This negative trend was explained by the comparable high amount of money spent on active labour-market programmes by these countries. The risk ratios in our main model for men and women were taken from a study on men. However the impact of unemployment may greater on women, as for example they may get less financial support due to only having worked part time (Bambra and Eikemo 2009). The results of LLTI and mental health problems in the unemployed might slightly overestimate the impact in the unemployed as the reference data was only available for the whole population and not just the employed. LLTI and people with mental health problems might also be overlapping as LLTI includes mental health problems.

Our study clearly demonstrates the detrimental effect of current levels of unemployment and increased unemployment on health, showing that the effect of the current recession and further job cuts will also impact significantly on the local health system. The true impact might be even greater for the reasons outlined above and, in addition, unemployment will also impacts on families and the wider community which were not included in this analysis and other negative health outcomes where the evidence is not strong enough to date might also be associated with unemployment. The impact of the current recession on health might also be greater compared to the previous ones, which served as the basis for our

calculations. Bambra (2010) concluded, for example, that support for the unemployed is less, benefit receipt is more stigmatised, the work environment has changed and social support has decreased compared to previous recessions. The current recession might also impact negatively on the health of those remaining in employment by creating more stressful and insecure work environments; these have been linked with ill health (Sverke et al. 2002).

If unemployment cannot be avoided in the first place, everything possible to support those becoming unemployed should be done. Besides financial support and help to be redeployed, initiatives should consider the different dimensions and possible interactions of unemployment (figure 2). Janlert and Hammerstrom (2009) found Johoda's model of latent functions (1982) to be best suited to explain the relationship between unemployment and ill health; meaning that initiatives to support the unemployed should cover some of these functions giving the unemployed time structure and opportunities for social contact. Other initiatives to prevent, detect and manage health problems among the unemployed have been located in the primary health care setting raising awareness of general practitioners in order to manage and support the needs of the unemployed (Harris and Harris 2009). However not all unemployed will seek medical advice. All initiatives should also bear in mind that the most disadvantaged are likely to suffer the most from unemployment (Bartley and Plewis 2002) and that these groups might find it more difficult to access services and support.

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Annex:

Table A1: Number of unemployed, economically inactive and economically inactive wanting a job in Wirral 05-06 to 09-10, (ONS 2011).

		05-06	06-07	07-08	08-09	09-10	Change 05-06 to 09-10 (%)
Unemployment	Male	4,700	6,600	6,800	8,000	8,900	89.4
	Female	2,900	3,500	3,000	3,600	2,900	0.0
Economically inactive wanting a job	Male	2,600	4,100	5,400	3,800	4,400	69.2
	Female	3,100	4,500	4,000	5,300	6,400	106.5
Economically inactive	Male	17,200	21,500	19,200	19,600	19,800	15.1
	Female	33,100	30,800	33,400	32,200	32,200	-2.7

Table A2: Unemployment rates (percentage of economically active), in Wirral, North West and Great Britain 05-06 till 09-10, (ONS 2011).

	05-06	06-07	07-08	08-09	09-10
All GB	5.3	5.4	5.3	7.0	7.9
All NW	5.3	5.7	5.9	7.7	8.4
All Wirral	5.4	7.1	7.0	8.4	8.5
Females GB	4.8	4.9	5.0	6.1	6.6
Females NW	4.5	4.5	5.2	6.3	6.6
Females Wirral	4.4	5.0	4.6	5.4	4.3
Males GB	5.8	5.8	5.5	7.7	8.9
Males NW	6.0	6.7	6.5	8.9	9.9
Males Wirral	6.2	9.2	9.2	11.1	12.3

Table A3: Relative Risk of mortality from heart disease due to unemployment.

			Circulatory diseases			Ischaemic heart disease		
Author	**Study population**	**Time**	**RR**	**LCI**	**UCI**	**RR**	**LCI**	**UCI**
Moser et al. (1984)	British men 15-64	census 1971 deaths 1971-1981	1.09	0.9	1.28	1.07	86	130
Moser et al. (1987)	British men 15-64	census 1971 deaths 1974-1981	1.21	0.98	1.47	1.2	0.93	1.5
Iversen et al. (1987)	Danish men 20-64	unemployed 1970 mortality 1970-1975	1.28	1.18	1.39	-	-	-
	Danish women 20-64	unemployed 1970 mortality 1970-1975	1.41	1.08	1.83	-	-	-
Martikainnen (1990)	Finnish men 30-54	1980 census and 1981-1985 mortality	1.54	1.4	1.7	1.36	1.18	1.56
Morris et al. (1994)	British men aged 40-59	screening 1978-1980 and five year follow up	1.64	1.1	2.43	-	-	-
Voss et al. (2004)	Swedish twin women born between 1926 and 1958	unemployment 1973, mortality 24 year follow up	1.3	0.5	3	1.3	0.4	4.5
	Swedish twin men born between 1926 and 1958	unemployment 1973, mortality 24 year follow up	1.2	0.8	1.8	1.2	0.7	2.1
Zagozdzon et al. (2008)	Polish men 20-65	1999-2004	1.88	1.61	2.19	1.54	1.12	2.07
	Polish women 20-60	1999-2004	1.56	0.98	2.08	1.56	0.55	3.61
Lundin et al. (2010)	Swedish men born 1949-51	unemployed 1992-94 mortality 1995-2003	-	-	-	1.08	0.76	1.53

Table A4: Limiting long term illness in the UK.

Great Britain			Percentages
	Men	Women	All
Other complaints	*0.36*	*0.74*	*0.57*
Infectious	*0.30*	*0.33*	*0.32*
Blood	*0.82*	*1.00*	*0.92*
Skin	*1.40*	*1.27*	*1.33*
Cancer	*1.77*	*2.28*	*2.05*
Ear complaints	*2.66*	*2.53*	*2.59*
Genitourinary	*2.96*	*2.43*	*2.67*
Eye complaints	*3.43*	*3.04*	*3.22*
Endocrine and metabolic	*5.46*	*5.78*	*5.64*
Mental disorder	*6.17*	*5.41*	*5.75*
Digestive system	*5.17*	*6.25*	*5.77*
Nervous system	*5.51*	*6.08*	*5.82*
Respiratory	*10.99*	*9.90*	*10.39*
Heart and circulatory	*20.42*	*18.41*	*19.32*
Musculoskeletal	*32.58*	*34.55*	*33.65*

1 People aged 16 and over in private households

Source: General Household Survey, Office for National Statistics